ERIE COUNTY

DECEMBER 1, 1956
VOL. 151—NO. 22

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

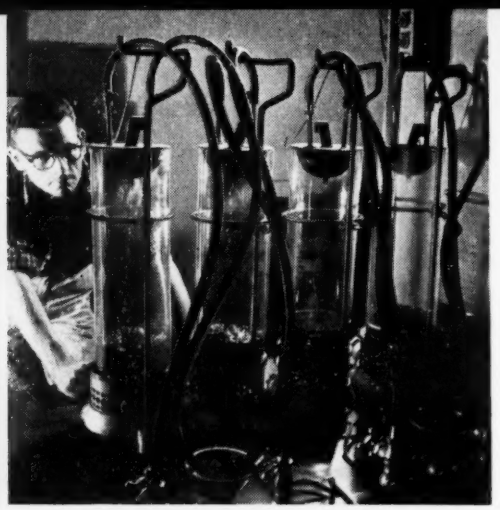
DOTS IN THE SKY

Yes, but they are really Bob Overton and Al Modispacher of the California Interstate Telephone Co. making annual inspection of a catenary suspension which crosses over part of Crowley Lake near Bishop. See p. 64 for story.

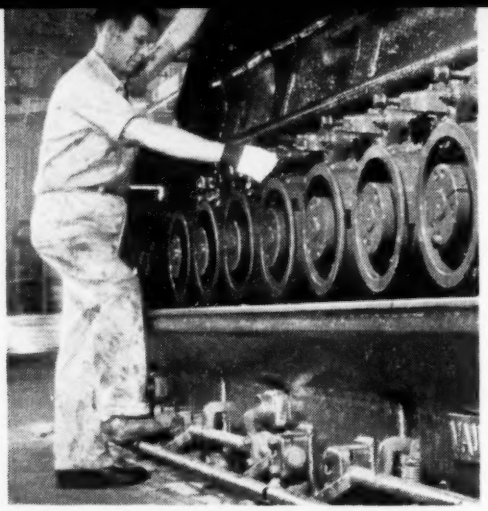
Guaranteed Circulation This Issue
14,048 of Which 11,014 Is Paid

FALL RURAL ISSUE

MANAGEMENT • PLANT • TRAFFIC • COMMERCIAL • LEGAL • ACCOUNTING

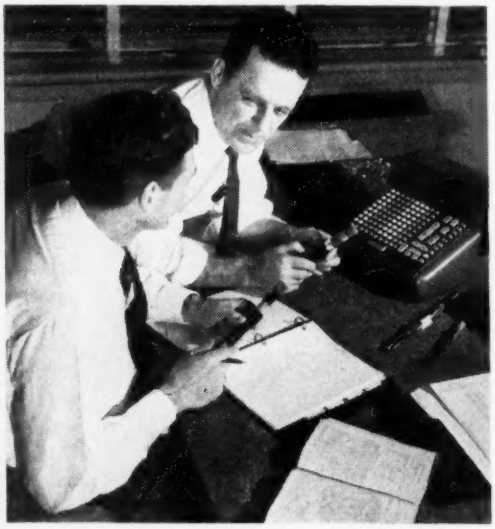


EXTENSIVE RESEARCH FACILITIES at Anaconda help get the answers to many of your cable problems.



MODERN MANUFACTURING METHODS and skilled technicians combine to produce highest quality products.

STRICT QUALITY CONTROL procedures insure fabrication of cable to exacting standards—for peak performance.



EXPERT DESIGN ENGINEERS develop telephone cable with superior transmission qualities, long life.

EXPERIENCE WITH ALL TYPES OF CABLE – aerial, direct burial, duct – is put to work on your problem.

PIONEERING EFFORTS IN COMMUNICATION CABLE for the Armed Forces—spiral-four, coaxial and signal cable, many others.

Now Anaconda puts its full resources "ON CALL" to you

Whether your problem is cable selection, application, a special engineering question, service or quality control—Anaconda will be happy to lend you a helping hand. For example . . .

Perhaps you don't have the facilities to check the quality of incoming cable—Anaconda's quality-control check on outgoing products can do this for you.

Or perhaps you have a technical question – the answer may have already been uncovered by Anaconda engineers.

In these and many other ways, Anaconda offers to help. Just call the *Man from Anaconda*—offices in 27 cities. Ask him, too, about Anaconda's line of telephone (type ATC) cables: **1. Aerial and duct cable. 2. Self-supporting cable. 3. Direct-burial cable. 4. Rural and urban distribution wire.**

Phone or write: Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y., or any of our 27 District Offices.

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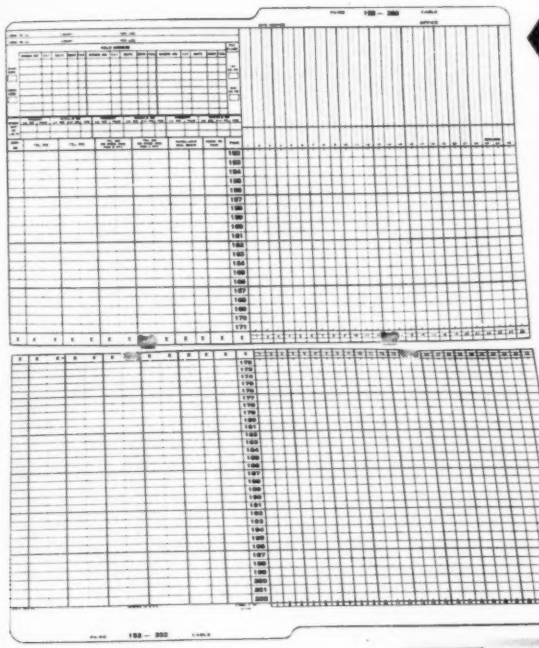
ACME VISIBLE

CABLE AND TERMINAL ASSIGNMENTS

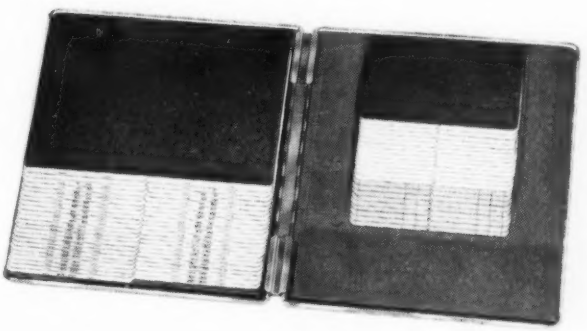
Designed by experienced telephone personnel to accommodate all of the various conditions encountered in the preparation of terminal assignment, exchange subscriber cable, and related basic plant records, in accordance with approved system practices.

Simplifies and speeds the work of assignment. Adaptable for large, intermediate and small centers with the flexibility to meet the requirements for peak and normal work loads, varying number of cables, and other local conditions.



Cable assignment forms. With preprinted pair numbers, filed in numerical sequence, exposing a 51 pair complement. Cards are of special Acme Endurex rag content stock to permit repeated erasures and changes. Forms available for 50 terminal capacity and 8 party stations; 44 terminal capacity and 10 party stations; and for rural areas with more party lines.

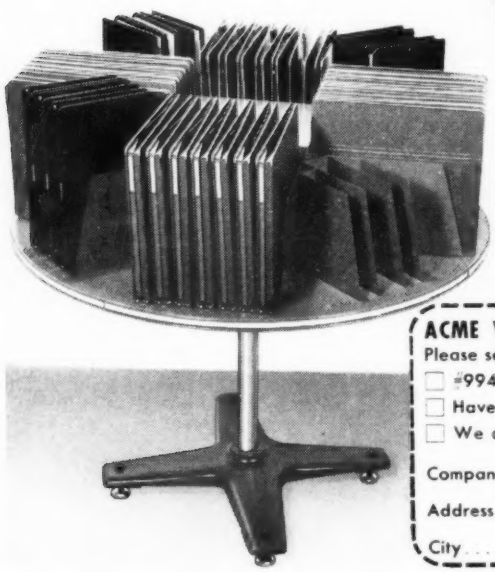
Terminal assignment forms. Eliminate the necessity of referring to supplementary maps to determine the correct distribution cable terminal. Forms available for distribution by (1) street, block or alley; (2) office building or apartment; (3) exchange wire.



Light weight metal-edged visible books for filing of cable cards on one side and terminal cards on the other, or for the same card on both sides of the book. Attractive gray Keratol binding.

Visible cabinets are available in a number of sizes. Each tray has a maximum of 102 forms or the equivalent of 5,100 cable pairs. Cabinets can be either stationary on stands or desks, or mounted on turntables.

Rotary equipment available in various sizes with and without push button motor. Books slide in and out without any lifting. They provide accessability to records at many points around circumference, and permit clerk to do a complete cable throw.



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CROZET, VIRGINIA

ACME VISIBLE RECORDS, INC., Telephone System Division, Crozet, Virginia T12-1-56

Please send us illustrated booklet

☐ #994 on Acme Multi-Card Bulletin Holders ☐ #982 on Acme Flexoline for Telephone Companies

☐ Have representative call. Date ..... Time .....

☐ We are interested in Acme Visible equipment for ..... KIND OF RECORD records.

Company ..... Attention .....

Address .....

City ..... Zone ..... State .....

DEPARTMENT OF TECHNOLOGY
BUFFALO AND ERIE COUNTY PUBLIC LIBRARY

FLASHES AND PLUGS

FUN CAPSULE. Wishing to furnish laughter as medicine, a Dutch medical student worked out a scheme to wake people up laughing on the telephone, reports the *English Digest.*

He sold the idea to various Netherlands hotels, where guests can ring him up to hear the latest joke. The idea was so popular that he ended up telling the same funny story 600 times a day, and now has to have his jokes recorded.

•

A LITTLE BIRD TOLD. AT&T's *Long Lines* magazine, in its September issue, carried the following story:

Recently in our files we came across an incident which might be called the case of the baffled repair clerk or the telltale bird. It seems that in Columbus, O., a repair clerk had reason to call a subscriber and, among other questions, he asked her if she had been receiving many wrong numbers lately.

"Not very many," replied the lady, "but the telephone does ring quite a bit when I'm out."

"When you're out?" queried the repair clerk.

"Yes," said the lady, "the bird tells me."

There was a pause while the caller thought that one over and the lady continued. "It's not a real bird, of course, it's made of plastic. When I leave the house I place it on the bell box. Then if the telephone rings the vibrations topple the bird onto the floor. And that," she added, "is how I know that I've missed a call."

•

CART BEFORE THE HORSE. A couple in South Africa have learned not to regard the post and telegraphs department as being slow, reports Reuters News Service.

Recently they decided to build a new house and, knowing the delay usually incurred in obtaining a telephone, they applied for one before the builders had started to work.

The department, however, was on its toes, and shortly afterwards a gang arrived to install a telephone in a non-existent house.

The telephone was put in position and a small shelter constructed around it.

•

FAIR ENOUGH. The following classified advertisement appeared in the *Arkansas Gazette*, reports the *Associated Press:*

"Wanted—girl to answer telephone, light typing, read magazines, work crossword puzzles. Must furnish own magazines and puzzles. Not much work, not much pay."

CIRCULATION

Guaranteed circulation of this issue is 14,048 of which 11,014 is paid.

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY
Since 1901

December 1, 1956

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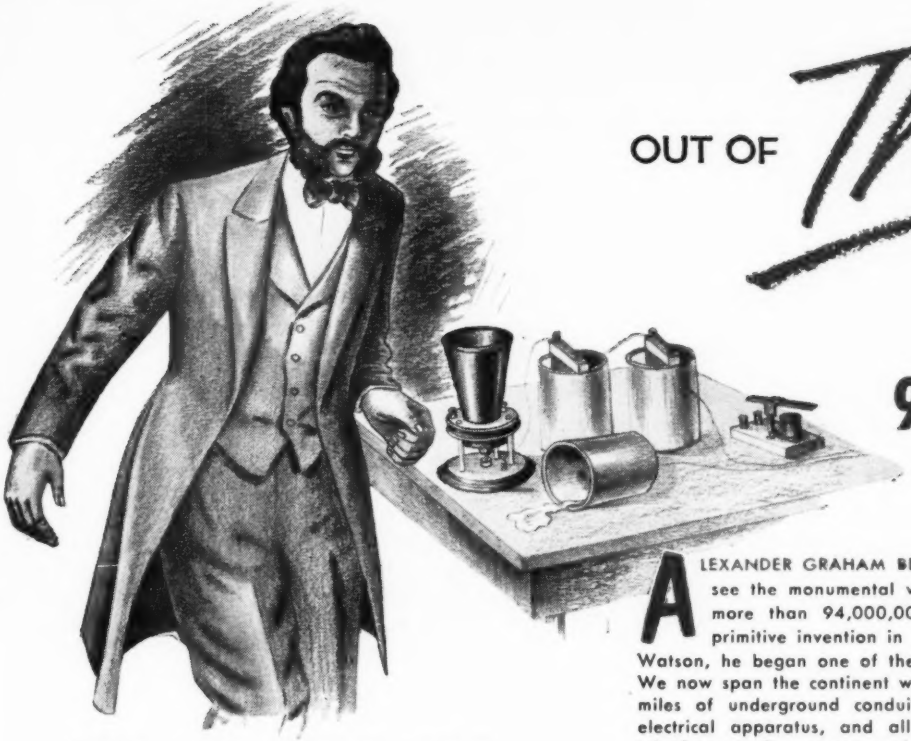

OUT OF *This...*

CAME

94,000,000

TELEPHONES

ALEXANDER GRAHAM BELL would no doubt be astounded if he could see the monumental worldwide network of voice highways, linking more than 94,000,000 telephones, which has resulted from his primitive invention in 1876. Speaking from room to room with Mr. Watson, he began one of the greatest advances in communication history. We now span the continent with our voices, and take for granted all those miles of underground conduits, elaborate and intricate "almost human" electrical apparatus, and all the research that has gone to bring the telephone to its present peak of efficiency.

Much of that "almost human" electrical apparatus is Lorain Products equipment. Its part in the intricate communications system is always a vital one, with the operation of the entire system often depending upon it. Under this responsibility, quality is a "must". We at Lorain are proud of the quality of our equipment, because we know it means better, more reliable service for you and your customers. Quality is never anonymous—invariably it has a famous name—a name that inspires unquestioning confidence. This confidence is yours when you buy Lorain equipment. For two decades this famous name has been the symbol of utmost dependability, and unmatched performance . . . giving lifetime, trouble-free, maintenance-free service to its users. We know that there are exciting possibilities ahead for the telephone industry, that only the surface has been scratched in this business, and we are constantly expanding our production facilities, doing never-ending research; doing our part to meet the challenge and to keep pace with world communications.

Whatever your power problem may be, our methods and facilities are yours to command. Without obligation, your problem will get expert, prompt attention. Our engineers will bring to your problem the benefit of many years of telephone power experience. If our standard equipment does not meet your requirements, we will design to meet your individual specifications. So phone, wire, or write . . . today.

AND THE NEED FOR

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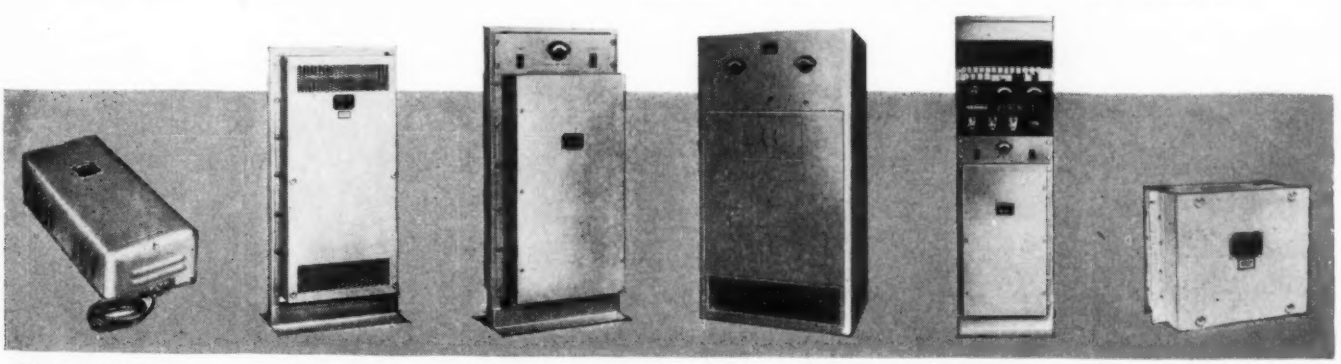
RINGING AND CHARGING EQUIPMENT!



Ringing-Talking Units
Eliminate the necessity for multiple or complicated installations by combining in one compact cabinet both ringing and talking power supply. Operate from 111, 117, or 123 volts, 60 cycle supply.

S-5 Sub-Cycle
One of a complete line of multi-frequency ringing converters. Utilizes Sub-Cycle circuits of proven dependability to generate Synchromonic frequencies. Adequate reserve capacity for exceptional load conditions.

Single Phase Flotrols
Capacities up to 24 amp. Most models available as Battery Eliminators. Special model FLOTROLS with particularly low sound level for PBX installations if equipment is in a business office.

Three Phase Flotrols
For plants requiring 25 amperes or more charging capacity. Current limiting feature protects charger against overloads. Exceptionally low power consumption especially during light load periods.

Lorain Power Panels
Regulated supplies with 2.5 to 50 ampere capacity for constant and fluctuating loads. With distribution, supervision and control features. Maintain regulated voltage normally and during power failures.

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Provide 130 volt plate current for carrier or repeater operation. Normally operate from 115 volt 60 cycle single phase power supply, transfer to built-in standby vibrator upon power interruptions.

OUR EQUIPMENT IS SOLD THROUGH LEADING TELEPHONE DISTRIBUTORS

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Products Corporation

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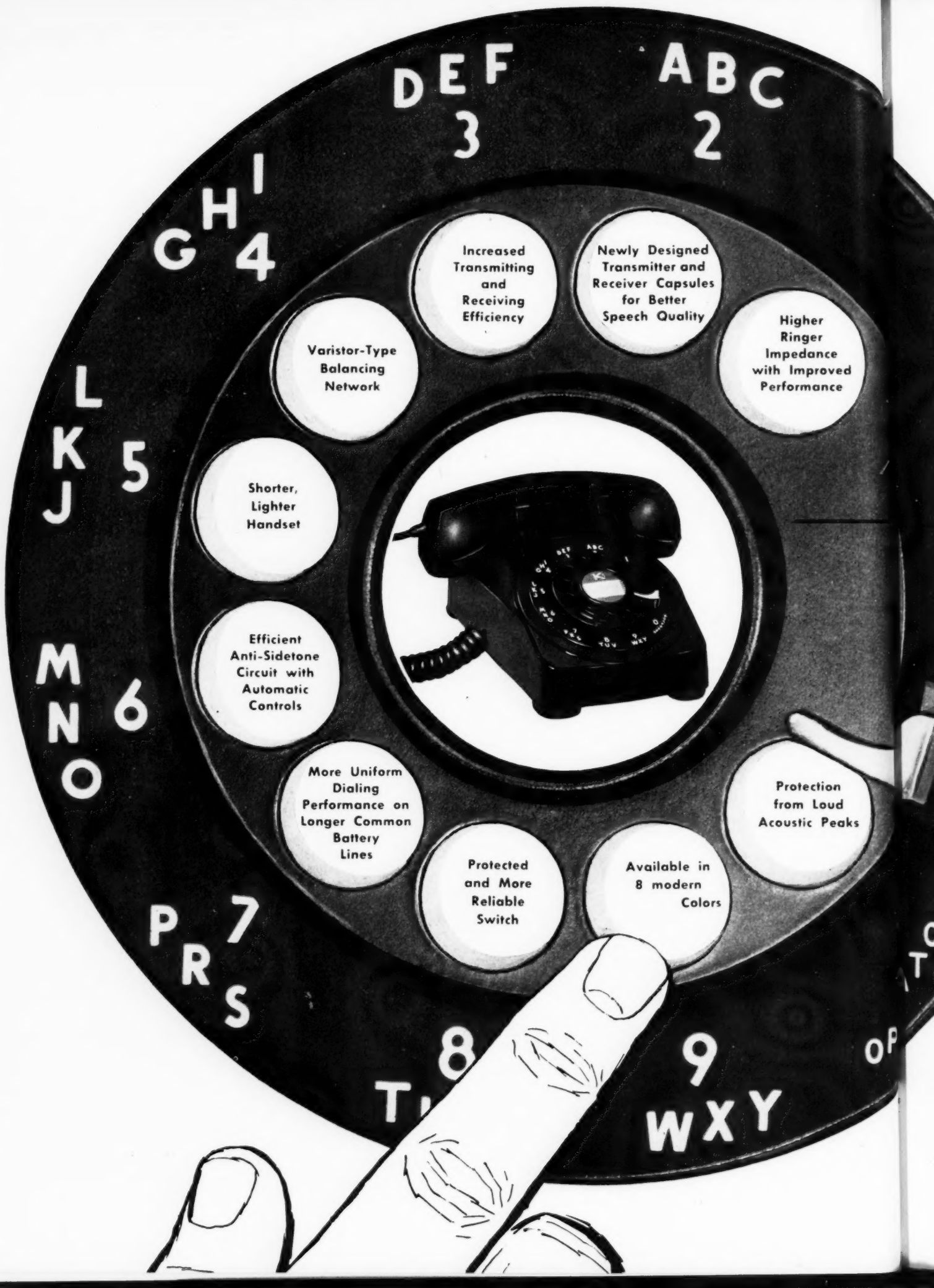
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ABC 2
GHI 4
JKL 5
MNO 6
PRS 7
TUV 8
WXY 9
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More Uniform Dialing Performance on Longer Common Battery Lines
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Protected and More Reliable Switch
Available in 8 modern Colors

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YOU CAN PUT YOUR FINGER ON THE THINGS THAT MAKE THE KELLOGG K-500 OUTSTANDING

Ten good reasons why the Kellogg K-500 Telephone is well worth your immediate attention. Not just vague generalities, but important, concrete advantages that automatically mean better service for your subscribers, and savings in maintenance and repair costs for you. Each advantage will be instantly apparent to you upon your very first demonstration—vast improvement in speech quality . . . uniform transmission, reception and sidetone . . . better transmission, dialing and ringing performance on much longer common battery lines. And then there's that wonderful plus-value of being able to offer your customers a choice of eight, two-tone decorator colors!

There's a detailed explanation of all these advantages in the interesting and informative K-500 Bulletin. A Free Copy is waiting for you now. Just drop us a note and we'll give your request immediate attention.

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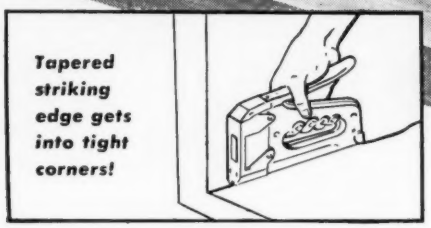
ONLY ARROW'S T-25 STAPLE GUN TAKES 3 STAPLE SIZES TO FASTEN ANY INSIDE OR OUTSIDE WIRE UP TO ¼" DIAMETER!



Tapered striking edge gets into tight corners!

- T-25 staple gun holds ⅜", 7/16", and 9/16" round crown, rust resistant staples, a full ¼" in width.
- Safe! No short circuits possible automatic mechanism stops staple at right height.
- Short span handle provides comfortable grip – minimizes fatigue.
- Arrow tackers are jam-proof! Can't jam even when struck against metal! Never any lost time on the job. Fully guaranteed
- No wire sag ever! If staple used doesn't hold wire taut, simply use next shorter leg length to insure firm hold and neat job.
- Staple leg lengths are long enough to insure firm hold in wood, plaster or composition board, etc Tack-pointed staple legs diverge to give even greater holding power
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T 25 LIST PRICE **$15.00**

Try Arrow without obligation!
Tackers will sent on approval for testing purposes. Send request to Telephone Division.

Available at your regular supply house. Priced for volume use!

ARROW T-75 FOR ANY INSIDE OR OUTSIDE CABLE UP TO ½" IN DIAMETER!

- T 75 tacker holds 9/16", ⅝" and ⅞" tack-pointed, rosin-coated staples, a full ½" in width
- Fastens 21 pair inside wiring cable, 26 pair, 12 pair wires, etc.
- Has all above mentioned Arrow features (except tapered head) to insure maximum speed and efficiency of operation!

T-75 LIST PRICE: **$15.00**

ARROW FASTENER CO. INC. 1 Junius Street, Brooklyn 12, N. Y.

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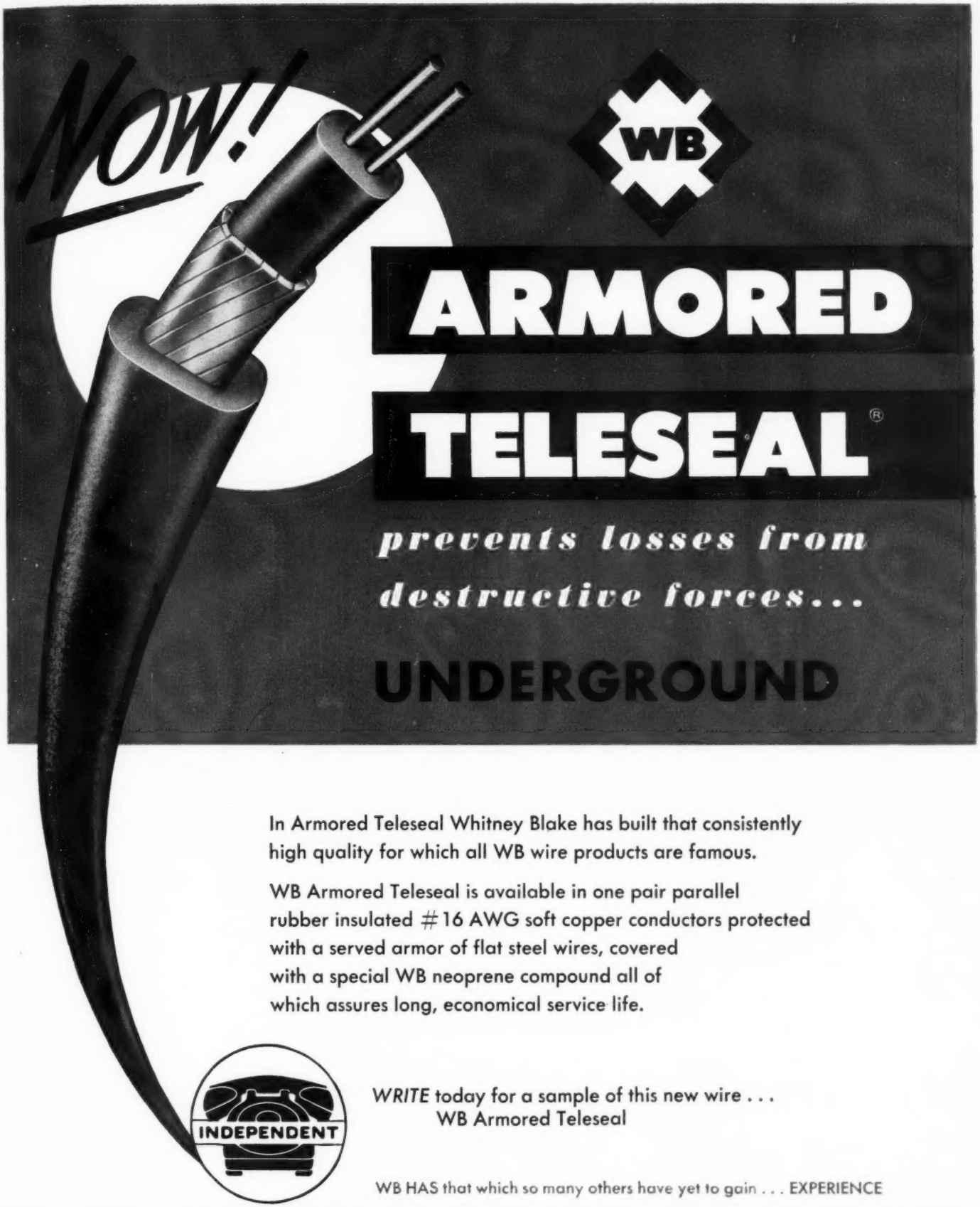

In Armored Teleseal Whitney Blake has built that consistently high quality for which all WB wire products are famous.

WB Armored Teleseal is available in one pair parallel rubber insulated #16 AWG soft copper conductors protected with a served armor of flat steel wires, covered with a special WB neoprene compound all of which assures long, economical service life.

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WRITE today for a sample of this new wire . . .
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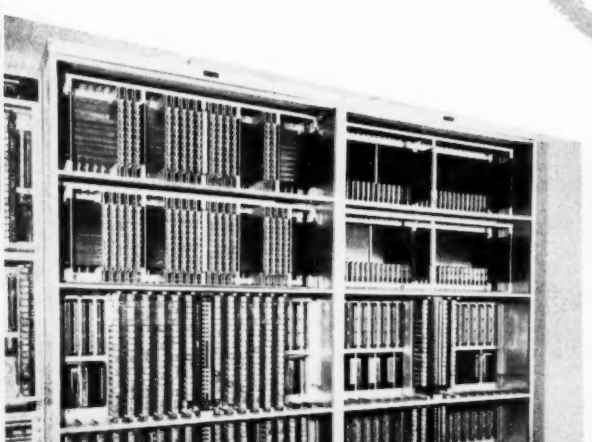

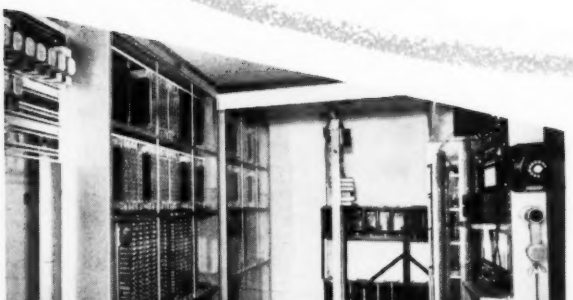

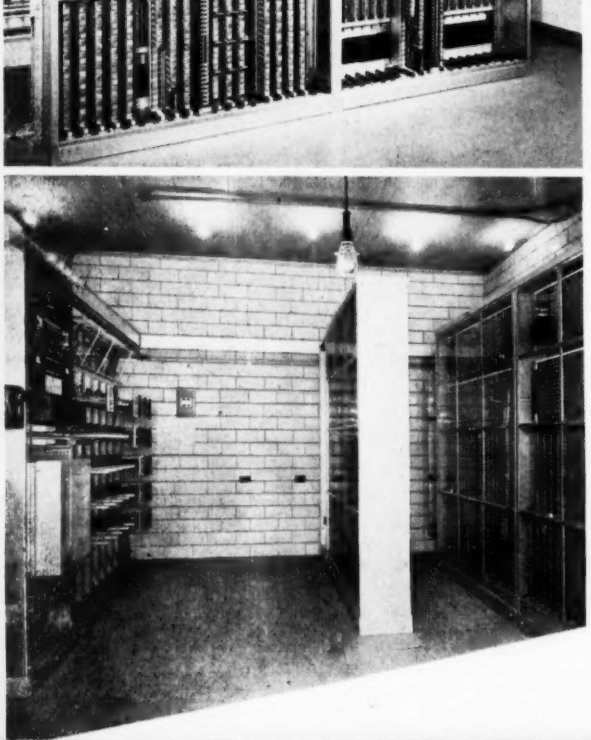

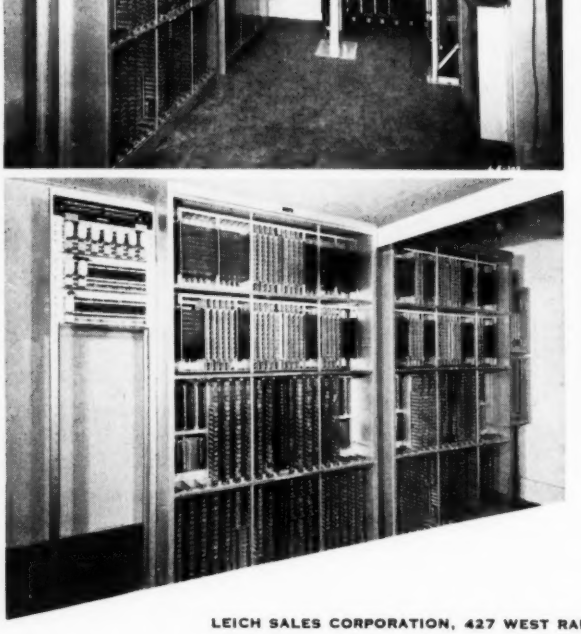

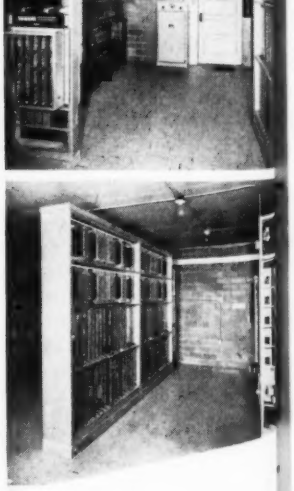

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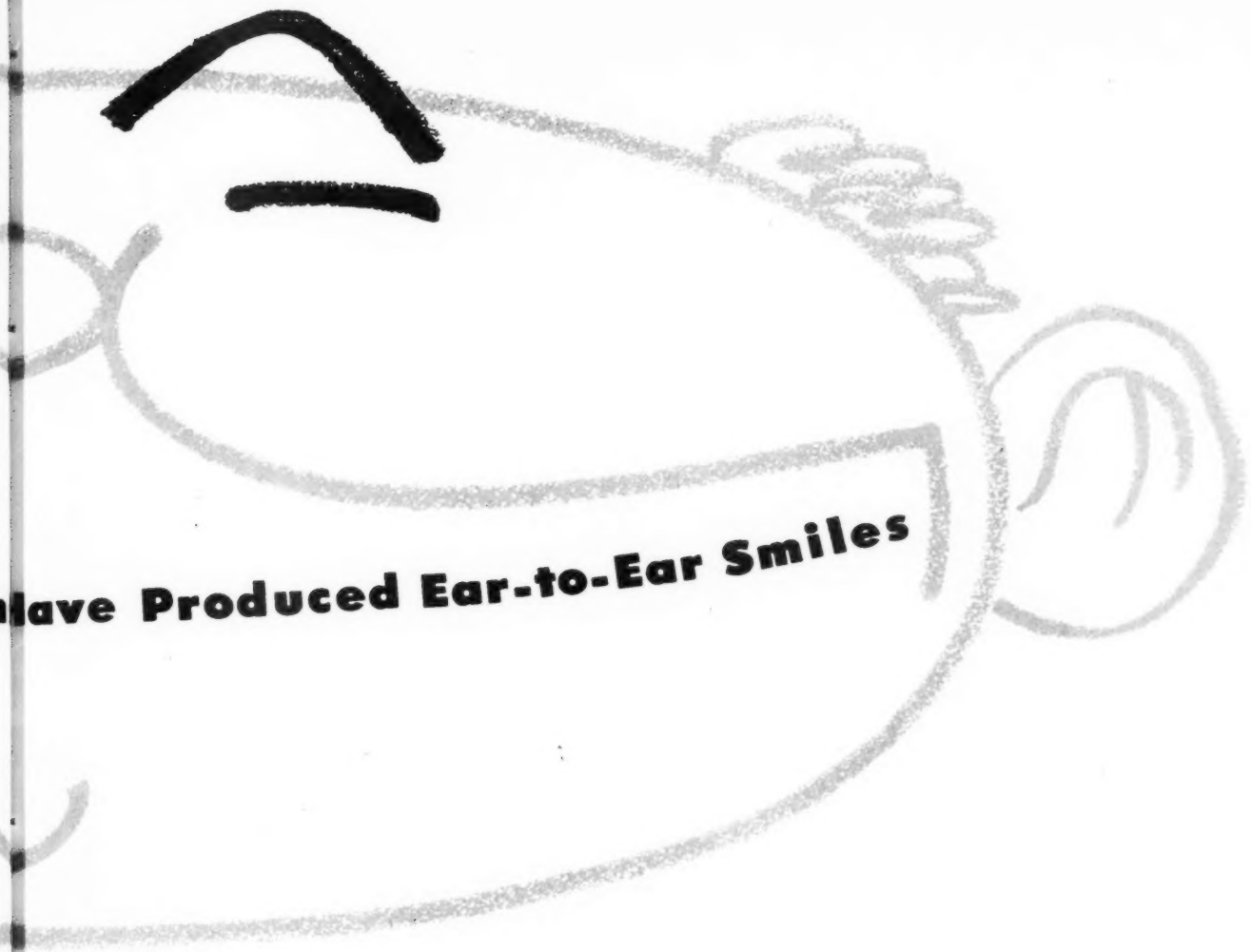

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We're happy to report that the over 800 Leich Dial Systems now in service have made their owners, and us, of course, smile from ear-to-ear. Here's why:

Leich's Dial System has given the small and medium size exchange a more simplified and flexible system.

It's simple because it's an all-relay dial switchboard. It eliminates elaborate mechanical switching mechanisms which are apt to wear and require maintenance or adjustment.

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Then, too, the Leich Dial System offers every desirable service and operating feature—enables you to give the finest, fastest dial telephone service.

These practical features have resulted in happy customers. They've recommended Leich's Dial System to other telephone men, and we've kept busy producing more and more dial systems. Naturally, this has made us smile from ear-to-ear, too.

All we ask is that you: Talk with the owner of a Leich Dial System. Write us for a catalogue. Ask us for a quotation. There's no obligation. Thanks.

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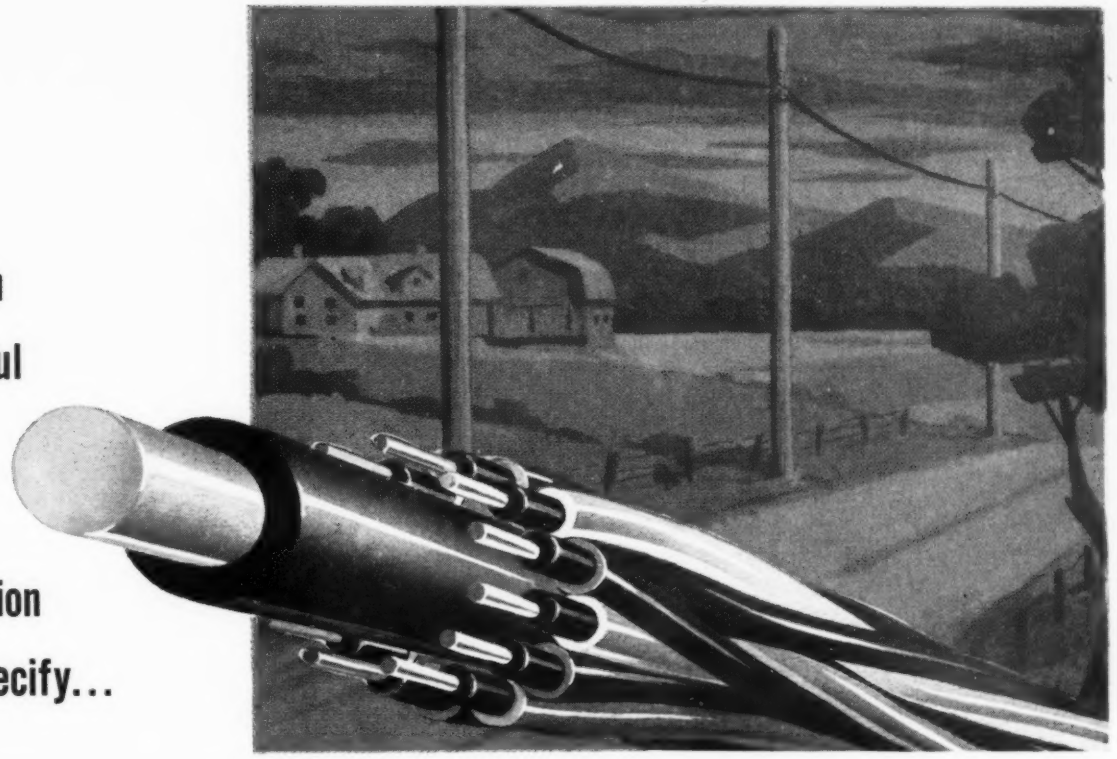

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Chicago, Illinois
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Chicago, Illinois

RURAL Black, high-molecular-weight polyethylene insulation ensures maximum resistance to environmental cracking, weathering, and abrasion. Applied over support wire as well as over the conductors. Tough, abrasion- and weather-resistant, color-coded PVC compound over insulation of each conductor gives added protection as well as rapid, positive polarity identification. Staggered pair lays minimize crosstalk. Controlled cabling permits easy access to support wire. 19 AWG Rural Distribution Wire is available in 1, 2, 4, 6, 11 and 16 pairs.

SUBURBAN Suburban Distribution Wire is a first cousin of Rural Distribution Wire, being of similar construction except the conductors are supplied in size 22 AWG. Available in 6, 11 and 16 pairs.

URBAN A specially-developed, color-coded PVC compound provides extreme weather resistance to conductors of General Cable Urban Distribution Wire, assuring excellent electrical characteristics for the short spans common to urban wire use. High-molecular weight polyethylene insulation over support wire minimizes environmental cracking and weathering. Staggered pair lays minimize crosstalk, superior cabling lay permits easy attachment to support wire. Available in size 24 AWG, 16 pair only.

GENERAL CABLE CORPORATION, 420 Lexington Avenue, New York 17, New York. Offices and Distribution Centers Coast-to-Coast.

for quality and service . . . **specify GENERAL CABLE**

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for you 99

Yes, "It's for you", a progressive

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The exciting new NORTH Ericofon is available

now—in six beautiful colors—Red, Ivory, Green,

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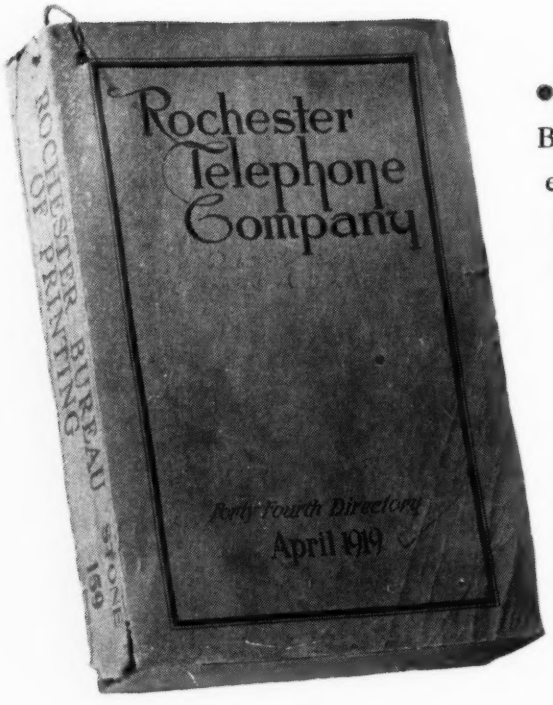

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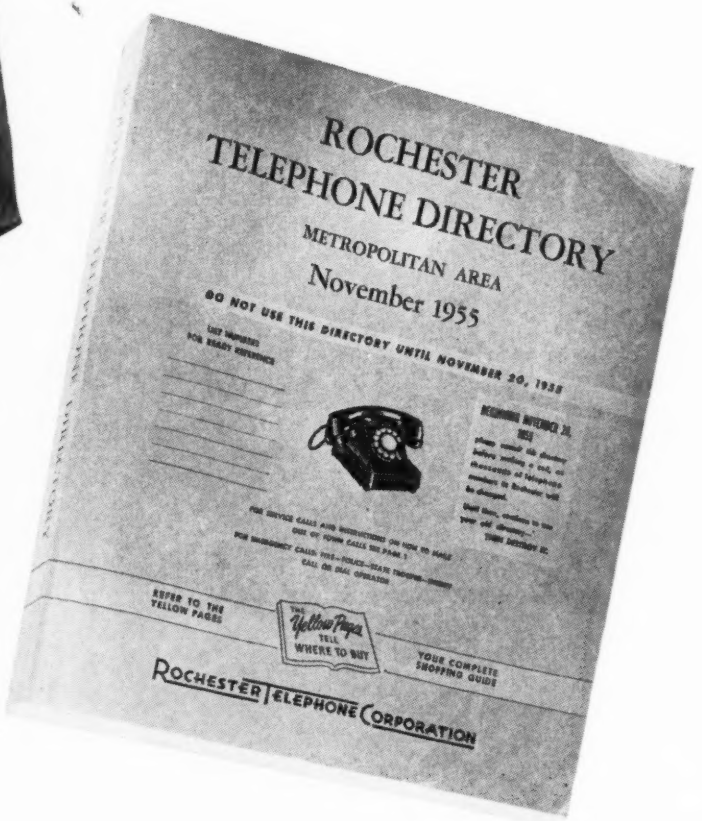

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XUM

IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH, WASHINGTON EDITOR

SEC inquires into the question of relative proportion of debt and equity of gas and electric utility financing. . . . Telephone companies should be interested in commission's findings. Reduction in Bell System pension to offset Social Security payment increases upheld. Automation subject of book on six lectures presented at University of Oxford.

SEVERAL weeks ago, in this department, mention was made of the current inquiry being conducted by the Securities and Exchange Commission (SEC) into the question of relative proportion of debt (bonds, loans, etc.) and equity (stocks) in utility financing. While this informal probe by the SEC is directed entirely to gas and electric utility companies (to which SEC jurisdiction is confined under the Holding Company Act), the possibility of collateral effect on telephone company regulation was noted.

Earlier this month, the deadline set by the SEC for the submission of comment on this question was passed. Washington observers are now beginning to hear about some of the data and views submitted. Most of these contributions agree on one general principle — that the percentage of senior capital (debt ratio) should be keyed to the foreseeable degree of normal risk involved in the particular enterprise. In somewhat plainer language, that means that each utility industry, has a normal foreseeable degree of risk and that the capitalization (proportion of bonds and stocks) should fall within a range reflecting that degree of normal foreseeable risk.

The transit industry, for example, is a public utility industry, which under present circumstances of competition with private automobiles and high operating expenses, has a very high risk compared with electric utility industry. Electric companies are probably performing, today, the least "dispensable" type of utility service of any public utility industry. That is to say, if there were hard times or a depression the customers of the electric utility would give up almost every other service which they may buy regularly before they would finally agree to cut off their utility service. And that would include their telephone and gas in about that order. Experience during the depression of the 1930's bore out that sequence of "dispensability" in gauging the comparable risk of utility enterprises. Of course, even electric utility customers — particularly large-scale users, such as industrial customers— might cut down on their volume of electric power consumption considerably under adverse circumstances. But, as long as they remain in business at all, they would probably make every effort to keep their electric meter connected.

Looking at the other end of the risk scale, the railroads and transit companies are the classic examples of the dangers of a high debt ratio, when adverse economic circumstances (competition in the case of the public transportation industry) makes an appearance. During the early part of this century, the railroads, then enjoying a comparatively safe monopolistic position in the transportation field, permitted their debt ratios to pile up enormously. Some of the bonded structures ranged in the order of 75 per cent of the entire outstanding capitalization. The development of the automobile— and later the airplane—both competitive forms of transportation for the railroads—were gradual over a period of years. Some economists now think that railroad company management of former years was remiss in ignoring the development of such competition until it was too late to do much about scaling down debt structures.

But, by the time the depression struck in the early 1930's a good many railroad companies had such high debt ratios that the fixed charges (interest on bonds), which had to be paid to avoid receivership, approached, and then finally overtook, the level of revenues available for paying such fixed charges. The result was the epidemic of railroad receivership which spread all over the United States. One of the campaign promises of the late President Franklin D. Roosevelt when he was elected for his first term over Herbert Hoover, in 1932, was a reform of top-heavy railroad financing which had brought about chaos in the nation's basic transportation system.

The woes of the transit companies came at a later date, mostly since the end of World War II (which gave the transit companies a little breathing spell of heavy patronage and reduced competition due to gasoline rationing, etc.). Today, most of the railroad and transit companies still in business have been recapitalized. Efforts have been made to scale down the debt ratio to more workable limits. But, it is still difficult for a good many of them to raise new money on a favorable basis (through the sale of common stock) in order to construct the necessary plant additions and take care of needed service expansion. In some cases, they have either to retrench or resort to the use of internal cash with the relatively low dividend pay-out.

The other major utility branches— gas, electric, and telephone—are today in a much better position for attracting new capital. Yet, they naturally wish to avoid future developments similar to those which caught up with the railroads and the transit companies. Telephone companies, in particular, are faced with the need for risking enormous amounts of new capital to take care of continued growth and expansion of plant facilities. They naturally bear

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in mind the bitter lesson learned at such a high price by the transportation utilities.

What, then, is a safe debt ratio range for gas and electric utilities and for telephone companies? Some time ago the SEC, in making a statement to a House Interstate Commerce sub-committee regarding its administration of the Holding Company Act, said that "an adequate equity cushion to absorb the vagaries of business conditions is an important attribute and a good security." So far, the SEC has backed away from any strait jacket or rule-of-thumb formula for gauging the reasonableness of the debt ratios of companies subject to its jurisdiction.

In earlier cases of reorganization under the Holding Company Act, the SEC indicated that the equity ratio (stocks) should not drop below 25 per cent of total capitalization unless dividends were reduced so as to retire earnings and eventually restore the margin of stock financing. Several of these early Holding Company Act decisions of the SEC developed a pattern of 50 per cent bonds, 25 per cent preferred and 25 per cent common stock. But, preferred stock financing in recent years has been losing out in favor of other forms of financing.

According to a publication of the Federal Power Commission, containing financial statistics for 111 natural gas companies during 1955, the over-all average was slightly more than 60 per cent long-term debt, 31 per cent common stock, and 8 per cent preferred. The gas industry has been increasing its debt ratio in recent years because of the extraordinary pipeline building activity, which tends to boost the bond capitalization *temporarily*. The average of the electric utilities shows a debt-to-equity ratio just at about a 50-50 breaking point (50 per cent debt, 12½ per cent preferred, and 37½ per cent common stock).

But even this debt ratio may turn out to be on the high side over the long-run, because it represents the outgrowth of much reorganization under the Holding Company Act. That leveling process is still working out.

(Please turn to page 66)

REA Approves $2,006,000 in Loans to Four Companies

New rural telephone loans amounting to $2,006,000 were made during the week of Nov. 12 by the Rural Electrification Administration, the U. S. Department of Agriculture announces. These loans to four telephone companies in Wisconsin, Missouri and Kentucky, will provide dial service to more than 4300 farms and other rural establishments, including 1606 with no telephones at present.

Details of the loans follow:

Boscobel (Wis.) Telephone Co.; $813,000, first loan (Nov. 15).

The borrower is a commercial company which plans to furnish improved service to 1,614 subscribers, including 293 rural families now without telephones.

The company now provides magneto and common battery service. It plans to acquire with its own funds access rights to 62 switched subscribers whose facilities are now owned by the Fennimore Telephone Co.

Construction proposed by the borrower includes automatic central offices at Boscobel, Mt. Zion and Steuben. In addition the company plans to house commercial office facilities in the Boscobel building. This will serve as a toll center for exchanges of neighboring telephone companies.

Harris G. Allen is president and Karl W. Mohr is manager of the Boscobel company.

*

Liberal (Mo.) Telephone Co.; $202,000, first loan (Nov. 16).

The borrower, a commercial corporation, proposes to furnish dial service to 496 rural subscribers, including 67 farm families now without telephones. The Liberal company is now providing magneto service to 429 subscribers. This includes 139 families who own their lines and are switched by the borrower. The company expects the majority of the switchers to become regular subscribers as soon as the new service is available.

Construction planned by the borrower includes an unattended automatic central office at Liberal and 88 miles of line.

Bernard L. Farrell is president and manager of the Liberal Telephone Co.

Eastern Missouri Telephone Co., Bowling Green, Mo. (successor to the Silex & Eolia Telephone Co.); $259,000, second loan (Nov. 16).

The borrower plans to furnish improved service for 527 subscribers, including initial service for 183 farm families.

The Eastern Missouri company recently acquired with its own funds the telephone properties serving the Martinsburg exchange area formerly owned and operated by the F and M Telephone Co. These facilities are now providing common battery, dial and magneto service from the Martinsburg central office.

Plans of the borrower include automatic central offices at Eolia and Martinsburg, and improved service in the Silex exchange. The two REA loans total $442,000.

W. R. Buchanan is president and manager of the Eastern Missouri Telephone Co.

*

Brandenburg (Ky.) Telephone Co.; $732,000, fifth loan (Nov. 16).

The borrower is planning to bring telephone service for the first time to 1,063 farm families, and to improve service for 643 existing subscribers. In addition, a portion of the funds will be used to complete other sections of the system now under construction.

The Brandenburg company recently acquired the Vine Grove Telephone Co. through the sale of stock. In addition, the borrower proposes to acquire 5 miles of line now operated by the Southern Continental Telephone Co. in the Vine Grove vicinity.

Construction planned by the borrower includes automatic central offices at Radcliff and Vine Grove, and expanded automatic facilities in the North Garrett exchange.

REA loans to the Brandenburg company total $1,752,000 which will enable it to provide new and improved services to 3,465 rural subscribers over 664 miles of line. Four exchanges are in operation and two are scheduled for cut-over in March 1957. Radcliff and Vine Grove, provided for in the latest loan, bring the number of exchanges to eight.

L. G. Hesler Sr. is president and J. D. Tobin is manager of the Brandenburg Telephone Co.

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ABC of the Telephone

by Frank E. Lee

PART 77. OUTSIDE PLANT CONSTRUCTION—Section 3. The preceding article in this series appeared in the Nov. 24 issue, p. 30.

THE TWO preceding sections on outside plant construction (TELEPHONY, Nov. 17 and 24) covered the planning of additions to the outside plant (Section 1) and discussed laying out the pole line, grading requirements, and gave a résumé of clearances to be observed in outside plant construction (Section 2).

This section covers poles, their selection, treatment, handling, storage, and gaining.

As in building a house on a good foundation, the strength and durability of a pole line depends upon the poles used to support the line. Nowadays, the selection of suitable poles can be practically as easy as the selection of any of the other material items used on the line.

Basically, choosing the poles for a given line always should start with the known factors of what the pole is required to do. These factors are as follows:

(1) Actual Load. How many open wires or what size and type of cable will be used on the line.

(2) Span Length in Feet. This determines the total weight to be supported by each pole.

(3) Clearance Requirements. The greater the clearance, the stronger the pole will have to be.

(4) Storm Loading District. This factor tends to multiply the total effects of other primary requirements. In a heavy storm loading district the additional stress of strong winds, heavy snow, and sleet increase the side thrust and down weight of the load supported by the pole.

Class of Pole

Poles are made from tree trunks and several types of trees are used in various parts of the country for this purpose. Typical trees used for poles are Northern White Cedar, Southern Yellow Pine, Western Red Cedar, Douglas Fir, Treated Chestnut, and similar species. There is a difference in the structural strength of the wood cut from these trees, just as there is a difference in the strength of various metals, fibres, and related products.

The difference in structural strength of the various woods used in poles has practically no meaning for the telephone company because the poles are graded by a standard classification. These classifications are divided into 10 groups, numbered from 1 to 10. A Class 1 pole is stronger than a Class 2, and a Class 2 is stronger than a Class 3. Thus, any pole included in any class group is considered equivalent to any other pole of equal length in the same class group.

Since the different woods used in poles have individual fibre stress ratings, the dimensions of poles in a given class group will vary between the various types of wood. To illustrate a typical example, the dimensions of Northern White Cedar poles are given in *Table 1*, the dimensions of Western Red Cedar poles are listed in *Table 2*, and the dimensions of Creosoted Pine poles are shown in *Table 3*.

It will be noted that the minimum

Dimensions

Western Red Cedar Poles

(Fiber Stress 5600 pounds per square inch)

Class		1	2	3	4	5	6	7	8	9	10
Minimum Circumference at Top (Inches)		27	25	23	21	19	17	15	18	15	12
Length of Pole (Feet)	*Ground Line Dist. from Butt (Feet)	MINIMUM CIRCUMFERENCE AT SIX FEET FROM BUTT (Inches)									
16	3½					23.0	21.5	19.5	No Butt Requirements ←		
18	3½			28.5	26.5	24.5	22.5	21.0			
20	4	34.5	32.0	30.0	28.0	25.5	23.5	22.0		No Butt Requirements ←	
22	4	36.0	33.5	31.5	29.0	27.0	25.0	23.0			
25	5	38.0	35.5	33.0	30.5	28.5	26.0	24.5			No Butt Requirements ←
30	5½	41.0	38.5	35.5	33 0	30.5	28.5	26.5			
35	6	43.5	41.0	38.0	35.5	32.5	30.5	28.0			
40	6	46.0	43.5	40.5	37.5	34.5	32.0				
45	6½	48.5	45.5	42.5	39.5	36.5					
50	7	50.5	47.5	44.5	41.0	38.0					
55	7½	52.5	49.5	46.0	42.5	39.5					
60	8	54.5	51.0	47.5	44.0						
65	8½	56.0	52.5	49.0	45.5						
70	9	57.5	54.0	50.5	47.0						
75	9½	59.5	55.5	52.0	48.5						
80	10	61.0	57.0	53.5	49.5						
85	10½	62.5	58.5	54.5							
90	11	63.5	60.0	56.0							
95	11	65.0	61.0	57.0							
100	11	66.0	62.0	58.0							

*The figures in this column are intended solely for use whenever a definition of ground line is necessary in order to apply specification requirements relating to scars, straightness, etc.

†Lines indicate length limits.

Table 1

circumference at the top is the same for both types of wood, regardless of the length of the pole. The minimum circumference at 6 feet from the butt (or bottom end) increases as the pole increases in length.

Further comparisons can be made between the various poles covered by the tables. As an example, consider a 25-foot Class 5 pole. The Northern White Cedar pole has a minimum circumference of 32.5 inches at 6 feet from the butt; the Western Red Cedar has a minimum circumference of 28.5 inches, and Creosoted Pine has a minimum circumference of 26 inches.

It should be noted, too, that there are upper and lower length limits for the various pole classes. For example, the shortest Class 1 pole is 20 feet in length, and the longest Class 7 pole is 50 feet in length.

Poles for Toll, Exchange, Cable

A number of tables and charts have been prepared to assist in the selection of poles for various purposes. Portions of typical tables have been included in *Table 4* to illustrate how pole requirements change in accordance with changes in actual load, or as the result of location in heavy, medium, or light loading areas. The data in *Table 4* covers treated Northern White Cedar or Western Red Cedar poles used under average conditions to build main leads to support toll, exchange, or cable construction in a heavy loading area.

Poles for Rural Line

Poles selected for rural line construction generally do not have to be as strong as those selected for toll or exchange lines. This fact is illustrated in *Table 5*. The usual practice is to design rural lines with a safety factor of one. Trunk lines, shown in *Table 4*, are designed with a safety factor of 1⅓. *Table 5* is designed for average conditions and can be used for all sizes of conductors.

It is interesting to note that *Table 5* also can be used for toll or trunk circuits or exchange lines carrying more than one crossarm, where a higher margin of safety generally is desired. As a general rule, poles on these lines are not stressed more than 75 per cent of their maximum. Thus, to select a pole from *Table 5* for these lines, use a span length that is 133 per cent of the actual span. For example, if the actual span is 300 feet, select the pole from the data listed in the 400-foot span length column on the chart.

CREOSOTED PINE POLES

American Standards Association Specification

CLASS		1	2	3	4	5	6	7	8	9	10
MIN. TOP Circ. (inches)		27	25	23	21	19	17	15	18	15	12
Length of Pole (Feet)	Ground Line Distance From Butt (Ft.)	Minimum Circumference at Six Feet from Butt (Inches)									
16	3½	....	....	....	....	21½	19½	18			
18	3½	....	....	26½	24½	22½	21	19			
20	4	31½	29½	27½	25½	23½	22	20			
22	4	33	31	29	26½	24½	23	21			
25	5	34½	32½	30	28	26	24	22			
30	5½	37½	35	32½	30	28	26	24			
35	6	40	37½	35	32	30	27½	25½			
40	6	42	39½	37	34	31½	29	27			
45	6½	44	41½	38½	36	33	30½	28½			
50	7	46	43	40	37½	34½	32	29½			
55	7½	47½	44½	41½	39	36	33½	....			
60	8	49½	46	43	40	37	34½	....			
65	8½	51	47½	44½	41½	38½	....	....			
77	9	52½	49	46	42½	39½	....	....			
75	9½	54	50½	47	44	....	....	....			
80	10	55	51½	48½	45	....	....	....			
85	10½	56½	53	49½	....	....	....	....			
90	11	57½	54	50½	....	....	....	....			

No Butt Requirement | No Butt Requirement | No Butt Requirement

Table 3

EXAMPLE OF POLE SELECTION DATA

LOADING AREA	LENGTH OF POLE IN FEET	SPAN LENGTH IN FEET 100 CLASS	125 CLASS	150 CLASS	175 CLASS	200 CLASS	ACTUAL WIRE LOAD
HEAVY	18	7	6	5	4	4	11-20 WIRES
	20	7	6	5	4	4	
	22	7	6	5	4	4	
	25	7	6	5	4	4	
	30	7	6	5	4	4	
	35	7	6	5	4	4	
	40	6	6	5	4	4	
	45	5	5	5	4	4	
	50	5	5	5	4	4	
	60	4	4	4	4	4	
MEDIUM	18	7	7	7	6	5	13-20 WIRES
	20	7	7	7	6	5	
	22	7	7	7	6	5	
	25	7	7	7	6	5	
	30	7	7	7	6	5	
	35	7	7	7	6	5	
LIGHT	18	7	7	7	7	7	11-30 WIRES
	20	7	7	7	7	7	
	22	7	7	7	7	7	
	25	7	7	7	7	7	
	30	7	7	7	7	7	
	35	7	7	7	7	7	
	40	6	6	6	6	6	
	45	5	5	5	5	5	
	50	5	5	5	5	5	
	60	4	4	4	4	4	

Table 4

Dimensions

Northern White Cedar Poles

(Fiber Stress 3600 pounds per square inch)

Class		1	2	3	4	5	6	7	8	9	10
Minimum Circumference at Top (Inches)		27	25	23	21	19	17	15	18	15	12
Length of Pole (Feet)	*Ground Line Dist. from Butt (Feet)	MINIMUM CIRCUMFERENCE AT SIX FEET FROM BUTT (Inches)									
16	3½					26.0	24.0	22.0			
18	3½			32.5	30.0	28.0	25.5	23.5			
20	4	39.5	37.0	34.0	31.5	29.0	27.0	25.0			
22	4	41.0	38.5	36.0	33.0	30.5	28.0	26.0			
25	5	43.5	41.0	38.0	35.5	32.5	30.0	28.0			
30	5½	47.5	44.5	41.5	38.5	35.5	33.0	30.5			
35	6	50.5	47.5	44.0	41.0	38.0	35.0	32.5			
40	6	53.5	50.0	46.5	43.5	40.0	37.0				
45	6½	56.0	52.5	49.0	45.5	42.0					
50	7	58.5	55.0	51.5	47.5	44.0					
55	7½	61.0	57.5	53.5	49.5	46.0					
60	8	63.5	59.5	55.5	51.5						

No Butt Requirements | No Butt Requirements | No Butt Requirements

*The figures in this column are intended solely for use whenever a definition of ground line is necessary in order to apply specification requirements relating to scars, straightness, etc.

†Lines indicate length limits.

Table 2

Poles for Aerial Cable

Poles for aerial cable plant can be selected on the basis of the weight of the cable per foot. A typical example is shown in *Table 6*. When the spacing is 20 per cent greater than that shown in the table, the next larger class pole should be used. This means a Class 5 pole would be used where a Class 6 is specified. If the spacing is 20 per cent less than shown, the next smaller class pole can be used; for example, a Class 7 instead of a Class 6 pole would be suitable.

When open wire lines are placed on the same poles with aerial cables, the cable load can be converted to an equivalent number of open wires as follows:

Cable Weight Per Foot	Equivalent No. of Open Wires in Each Loading Area		
	Heavy	Medium	Light
Less than 6 pounds	10	10	20
Six pounds to 12 pounds	20	20	30

TABLE 4 POLE CLASS SELECTION

OPEN WIRE CONSTRUCTION

NUMBER OF WIRES	HEAVY STORM LOADING AREA Class of New Pole When Average Span Length is:								MEDIUM STORM LOADING AREA Class of New Pole When Average Span Length is:								LIGHT STORM LOADING AREA Class of New Pole When Average Span Length is:								NUMBER OF WIRES
	100′	150′	200′	250′	300′	350′	400′	450′	100′	150′	200′	250′	300′	350′	400′	450′	100′	150′	200′	250′	300′	350′	400′	450′	
2	10	10	10	10	10	10	10	9	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	2
4	10	10	10	9	9	9	9	7	10	10	10	10	10	10	9	9	10	10	10	10	10	10	10	10	4
6	9	9	9	9	7	7	7	7	10	10	10	9	9	9	9	9	10	10	10	10	10	10	10	10	6
8	9	9	9	7	7	7	6	6	9	9	9	9	9	9	7	7	9	9	9	9	9	9	9	9	8
10	9	9	7	7	6	6	5	5	9	9	9	9	9	7	7	7	9	9	9	9	9	9	9	9	10
12	9	9	7	7	6	6	5	5	9	9	9	9	9	7	7	7	9	9	9	9	9	9	9	9	12
14	9	9	7	7	6	6	5	5	9	9	9	9	9	7	7	7	9	9	9	9	9	9	9	9	14
16	9	9	7	7	6	5	5	4	9	9	9	9	7	7	7	7	9	9	9	9	9	9	9	9	16
18	9	7	7	6	6	5	4	4	9	9	9	9	7	7	7	6	9	9	9	9	9	9	9	7	18
20	9	7	7	6	5	5	4	3	9	9	9	7	7	7	6	6	9	9	9	9	9	9	7	7	20

Table 5

Poles at Railroad Crossings

Poles used to support spans at railroad crossings may be of the same size as the poles used on the rest of the line, except that they should not be smaller than Class 7.

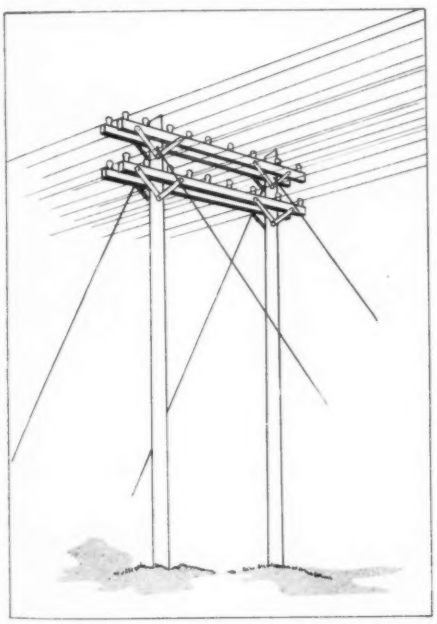

Fig. 1

Terminal Poles

Poles used to terminate open wire or cable should be one class larger than the poles used in the rest of the line.

"H" Fixtures

"H" fixtures generally are used where suitable guy wires cannot be placed. A typical "H" fixture is illustrated in *Fig. 1.* As a rule the two poles are set 6 feet 8 inches between centers. On open wire lines, a double crossarm is used to prevent the line wire from slipping through the wire ties at the insulators. In many instances an "H" fixture is used wherever it is desirable to add extra strength to a line exposed to severe storm damage. Usually, poles chosen for "H" fixtures are one class smaller than the other poles used along the lead.

Treatment of Poles

Without a single question or doubt the best type of pole to use for any line building purpose is a treated pole. Usually the treatment is applied in a pressure tank which drives the treating compound deep into the pole. Excellent results have been obtained from pentachlorophenol, creosote, and similar solutions.

To appreciate the money saving benefits to be had by using treated poles, one has only to observe the rapid deterioration of untreated poles which may be used in fence lines, or to support bird houses and similar uses around the home and farm.

CLASS AND SPACING OF POLES SUPPORTING AERIAL CABLE

WEIGHT OF CABLES PER FT. (IN LBS.)	STORM LOADING AREA					
	HEAVY		MEDIUM		LIGHT	
	Class of Pole	Spacing of Poles (per Mile)	Class of Pole	Spacing of Poles (per Mile)	Class of Pole	Spacing of Poles (per Mile)
Less than 6 lbs.	5	40	6	35	6	30
6 lbs. to 8.5 lbs.	4	40	5	35	5	30

Table 6

In some instances, a well-treated pole will outlast an untreated pole by a ratio of about 8 to 1. Viewed in the light of savings in maintenance costs alone, treated poles are an excellent investment and are strongly recommended for use on telephone lines.

Storage of Poles

In most cases, the telephone company

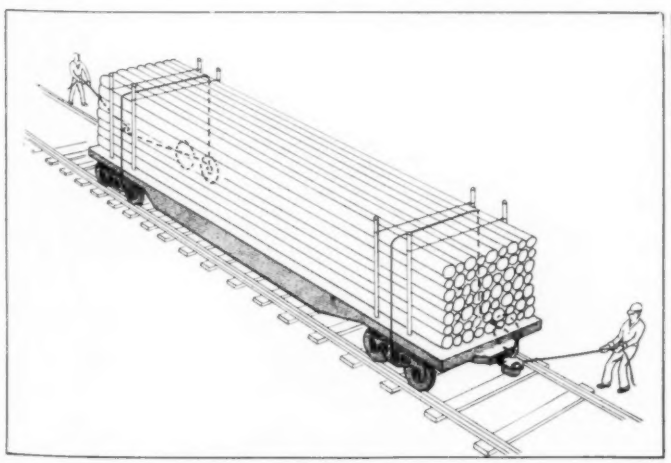

Fig. 2

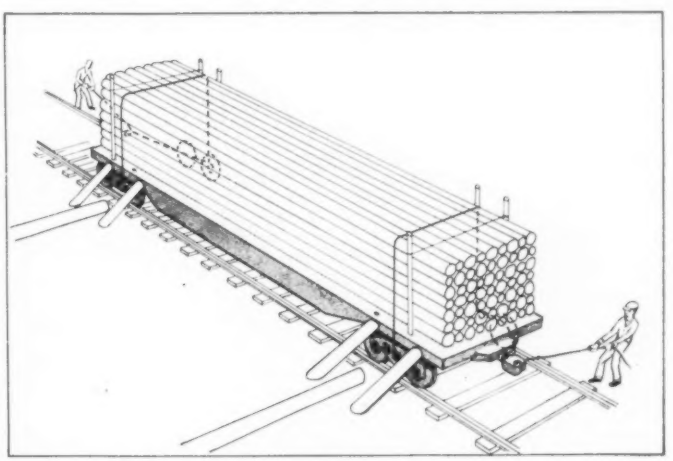

Fig. 3

will have to keep poles in storage for a period of time before they are placed in service. This is pretty much the same kind of storage problem as the local lumber yard faces in storing lumber before it is delivered to the customer for actual use. The big difference, of course, between the lumber in the local lumber yard and the telephone poles is that the poles are treated to resist deterioration and decay.

Once properly treated, poles can be safely stored under any conditions. They also may be left along the pole line right-of-way for indefinite periods without fear of attack from insects or deteriorating fungus growth. In spite of these advantages favoring treated poles, it is still good policy to see that they are stored under the best possible conditions.

The following suggestions for storing poles will help insure that the poles are in the best condition when the time arrives to place them along the pole line. This is just another case of preserving the full quality of a good product until it is placed in service:

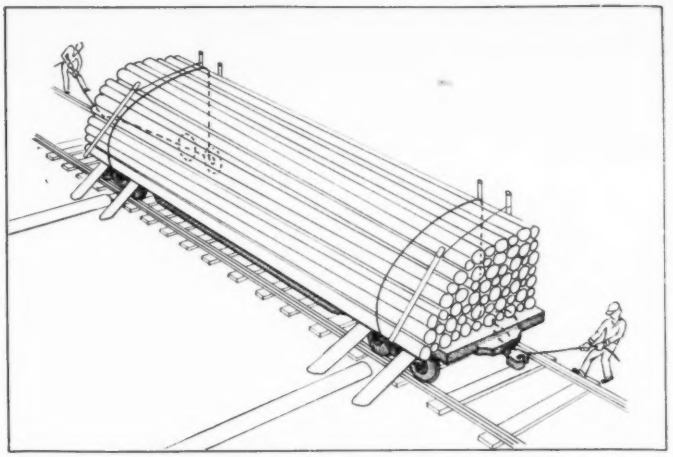

Fig. 4

(1) Keep the storage yard clean. Remove any rotten pole butts or rotting wood of any description. Gather and burn all blocks, stubs, or other pieces of timber showing signs of deterioration. (Pieces of rotting wood may be a source of infection for the sound wood in new poles.) Remove all weeds or vegetation from the immediate area where the poles are stored. A 2 or 3-inch layer of cinders over the ground will help prevent re-growth of weeds once they are removed. If any weeds persist in growing after this treatment, the application of a commercial brush and weed killer is recommended.

(2) Store poles on skids. For the best circulation of air around the poles, elevate the skids to provide approximately 2-foot clearance from the ground to the underside of the pole pile. Apply a liberal coat of pentachlorophenol solution, creosote, or a similar wood preservative to the skids at the point of contact with the poles. Whenever the skids are free of poles repeat the application of the preservatives.

(3) Change position of poles at regular intervals. At least once in every three months, reroll the poles in the pile to change their points of contact with each other and with the skids. This minimizes the possibility that wood-destroying fungi will develop and grow on the stored poles. If signs of deterioration should appear, shave the spots clean and cover the shaved area with the same type solution used to treat the pole originally.

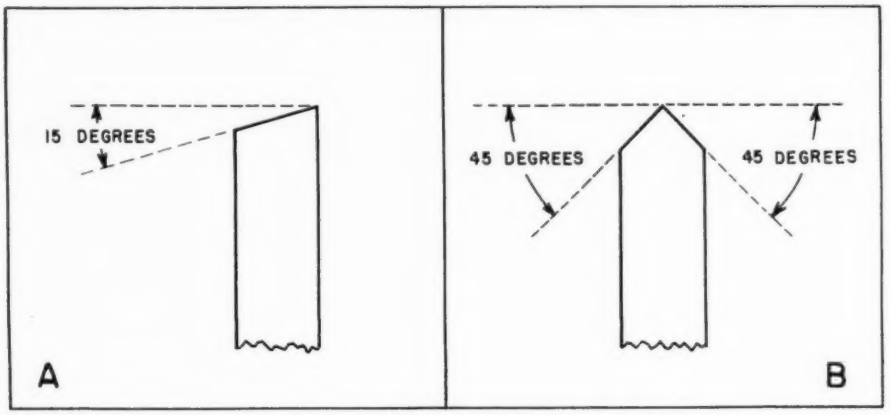

Fig. 5

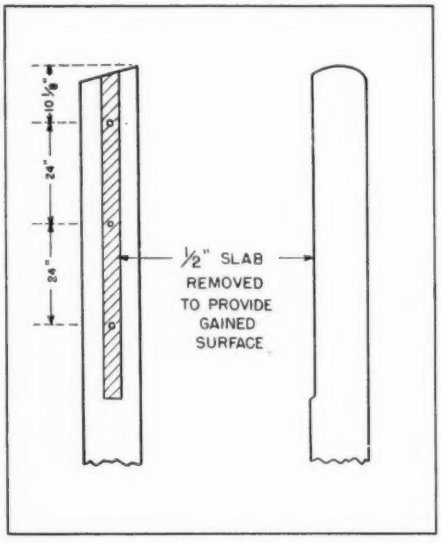

Fig. 6

Unloading Poles

Semi-trailer loads or carloads of poles often travel long distances before they arrive at the local storage yard. During the journey the load may have been subjected to rough handling and stakes or wires binding the load may be broken or weakened. Under these conditions a certain degree of hazard exists in the unloading operation.

The following unloading steps are suggested to avoid any unpredictable or unforeseen hazard:

(1) Stay off the top of the load. Do not permit any man to climb on top of a load of poles, regardless of whether or not the trailer or car and its bindings appear in good condition.

(2) Check each stake. Before starting to unload, check each stake on the trailer or car to be sure it is not broken or has not been sheared off at the stake pocket.

(3) Check each stake pocket to be sure they are tight. Also, check to see that the stake pocket bolts, rivets, or weld are neither loosened, cracked, or broken.

(4) Examine the binding wires. Make as complete an examination as possible of each of the load binding wires to make certain that they have not been broken while the load is in transit.

NOTE: If broken stakes or defective stake pockets are found *on the side opposite* the side to be unloaded, the stake or stakes or entire car or trailer body should be braced. For this purpose, select a timber or timbers of sufficient strength and length which can be braced at about the middle of the load and at an angle of about 45° to the ground. These additional braces will practically eliminate the chance of the load slipping backwards against a weakened stake or stakes when the

(Please turn to page 52)

Key To Progress —The UNCOMMON Man

*By Crawford H. Greenewalt**

IN THE WORLD of wonders created on earth, there are few so remarkable as the modern phenomenon of speech-making. I don't suppose there is a meal at which 10 or more people gather that is not blessed, or otherwise, by an address of some sort. In fact, one might say that the after-dinner speech has become one of the occupational hazards of modern times, and I leave it to you to decide whether the hazard is more severe for the speaker or for his audience.

The art of speech-making is as yet untouched by technology or automation, and still remains in the Do-It-Yourself realm of man's affairs. This archaic situation may not last much longer for I am told that a group of scientists is busily engaged in teaching electronic computers the art of speech. That seems to me a most dubious objective. The flood of words to which the average citizen is subjected is already quite sufficiently torrential.

On the other hand, a talking electronic brain suggests interesting speculations. I can imagine, for example, Mr. Maier (Irwin Maier, dinner committee chairman) at some future date suggesting to his associates that they get the Du Pont "Univac" for their next banquet. He might, I suppose, point out that it had been given a brand new set of transistors, had split the sides of those attending the Amalgamated Gimmick Manufacturers' convention, had clarified knotty points on the nature of the universe at the last American Physical Society meeting, and had provided thoughtful uplift at a recent Salvation Army banquet.

Unfortunately for me, all of this is considerably in the future, and so I have had to nudge my own old and feeble mental transistors to put together a set of words that would be neither too long nor too inarticulate for this distinguished audience.

The guides to public speaking all seem to suggest that the subject be tailored to the audience, which means, I suppose, that I should deliver myself of some well-chosen remarks on the art of newspaper publishing.

Frankly, this is something for which I have neither the capacity nor the courage. And so, pushing my circuitry back into its own domain, I thought I would try to give you some thoughts on the world of large industrial enterprise as viewed from the inside out—this simply to create a contrast, hopefully favorable, between the all-too-frequent gloomy glimpses that seem to be given from the outside in.

Any discussion of this sort requires perspective and, hence, some point of past reference. Since the only available time machine seems to have been pre-empted by Alley Oop, I thought I had better, and perhaps more appropriately, turn to the newspaper files. And for that exercise I selected the year 1902, which happens, not entirely by coincidence, to be the year in which I was born. I did find in my searches some fascinating trivia, such as a sale of goldheaded canes, a report on bargains in the mouth-organ industry, an ad for red flannel undershirts, an announcement of a starter set for home blacksmithing and a note on the popularity of a new game called Ping-pong. I regret to report that there was no headline announcing the arrival of a young Greenewalt.

Names Meant News

My principal finding, and, in fact, the one I was looking for, was that names really meant news in 1902. Businesses were identified with their principal officers or proprietors; newspapers were the personal voices of their editors and publishers; a college was intimately associated with the name of its president—Dr. Eliot of Harvard, for example, and Dr. Wilson, whom some of you may be old enough to remember, at Princeton before his sojourn with a somewhat larger institution. The great scientific and chemical developments of that day were recognized as the prodigies of individual inventors.

Standard Oil was John D. Rockefeller. The Morgan bank was J. P. Morgan. The Louisville *Courier* was Henry Watterson just as the New York *World* was Joseph Pulitzer. The largest newspaper chain of the day was William Randolph Hearst. The electric light was Thomas Edison; the telephone, Alexander Graham Bell; and the Ford car was Henry, Senior, himself.

Today, the emphasis has passed from these colorful, personable, and somewhat rugged individuals to the relatively quiet anonymity of the group. Standard Oil has become a large company managed by many people. The large newspaper now sees itself as an institution, no longer engaged in the rough-and-tumble of personal journalism. Universities have become large-scale purveyors of education.

Developments in science are only rarely attributable to one person, and come into commercial being through the synthesis of a great number of individual contributions.

Group Replaces Individual

What has been happening for the last 50 years has been a gradual replacement of the individual by the group. This is a natural, even an inevitable development as our economy and its component parts have grown in size and stature. Only what we now call small businesses can be encompassed and directed by a single mind.

As our enterprises grow, delegation of authority becomes more and more essential to successful operation, with the result that there remain very few large-scale activities that can be clearly identified with a single individual.

In spite of all this, we seem to continue the practice of substituting for the individual a kind of stereotype in caricature associated with any given vocation.

*Mr. Greenewalt is president of E. I. du Pont de Nemours & Co. He presented this talk before the 43rd anniversary dinner of the Bureau of Advertising, American Newspaper Publishers Association in New York City.

XUM

There is, for example, the absent-minded professor, with the implication that academic life attracts absent-minded people or causes people to become absent-minded. We have, if you will forgive me, the inebriated reporter, the libelous inference being that newspaper work holds a lure for alcoholics, or that there is something about newspaper work that drives men to drink. The long-haired musician or scientist, the bluff and hearty salesman are types that I am sure you will recognize.

Stereotype of Businessman

The businessman, according to this dictionary of typical specimens, is materialistic, selfish, irritable with his employes, indifferent to his wife, contemptuous of the fine arts, and insatiable in his pursuit of money.

To businessmen as individuals, this type-casting is, at worst, irritating and, at best, wryly amusing. But I am afraid, nevertheless, that it has made its mark and has created in the minds of the average person the myth that the public welfare is in some way in danger, that society needs protection from these businessmen in caricature.

If I can insert here a personal note, I might record the fact that I started my career many years ago as a scientist—hence, at that time, was presumably long-haired, and doubly so since I was also an amateur musician. Imagine how disconcerting it was, some years after having made the transition from the laboratory to the business office, to find myself characterized by no less an agency than the Department of Justice as a "monopolist by marriage," and by the *Daily Worker* as a bloodless capitalist. Time, Inc., was kinder—calling me merely "graying, hawk-nosed," a term my children adopted with some glee.

No Typical Businessman

The fact is, of course, that any generalization about the practitioners of business or of any other profession is utter nonsense. Business, as an institution, recruits its people from the same melting pot which supplies the human raw material for any other trade or vocation.

You would be as hard pressed to find a typical businessman as you would a typical sports writer, professor, or musician. Business, like all other professions, is made up of people with all kinds of backgrounds, all kinds of motivations, all kinds of habits of behavior.

Business, in short, does not attract a particular type, neither the morally weak, nor the wickedly inclined, nor the knights in shining armor. It is, on the other hand, comprised of perfectly normal, reasonable human beings, subject to whatever frailties and limitations characterize man on this earth. They represent a cross-section of society —the brilliant and the dull, the generous and the grasping, the expansive and the petty, the good and the bad.

Here are ordinary human beings grouped together in organizations designed to complement the weakness of one with the strength of the other, to temper the exuberance of the young with the maturity and wisdom of the old. Whatever individual dispositions may be present, it is the average, the composite, that governs.

So, if we can concede that people in the main have decent and honorable instincts, I believe it must necessarily follow that those in the business world will average out at about the same moral level.

Business Misjudged

Business, unfortunately, is too often judged in black and white. Errors have been made by businessmen in the past and, in an imperfect world, will certainly continue to be made in the future. Such errors must, of course, be identified and corrected promptly. But emphasis on things which are wrong must not be allowed to obscure the things which are right. For it is an unassailable fact that economic progress of the most monumental kind has come about through the business process.

Much has been said in recent years of the "new type of businessman," as if, by some process of sexless eugenics, the bull terriers and bloodhounds of the business past had been crossbred to produce a race of intelligent and kindly poodles. I have never been able to accept this concept. It seems to me that men will always reflect the society in which they live, will respond to its pressures, its ideals, and its customs.

As society as a whole develops and grows both spiritually and materially, the individuals comprising it will, on the average, grow and develop with it. In business endeavor, there is an added pressure for conformity to the public interest, arising simply out of the numbers of people involved in any given management decision.

Emphasis on Continuity

The change over the years from the responsible individual to the responsible group has greatly increased emphasis on continuity of a given enterprise. Fifty years ago, a man was disposed to look upon his business as ending with his lifetime, and his policy decisions were, accordingly, geared to a relatively short span of years. Today, business enterprises have accumulated, so to speak, a life span of their own, starting in some cases in the remote past and going on into the unforeseeable future. Its managers have become torchbearers, accepting the responsibility passed on to them by their predecessors and aspiring to pass on a healthy and dynamic entity to their successors.

The Du Pont Company is an outstanding example of the point I wish to make. We are an old enterprise, and have what I think is a proud record of fruitful contribution to the American scene over a period of more than 150 years. I can assure you that the traditions of the past, the ethics and high performance of the many men who have participated in our enterprise have become an almost palpable force in their influence on those of us who, for a brief span, have the responsibility for carrying the enterprise forward.

It seems to me almost axiomatic that, over the long stretch of corporate life, no business can prosper unless it serves the public interest in all of its many facets. And, as a business develops and its policy-making decisions are delegated to an ever-increasing number of people, business conduct will in itself reflect the public interest as it may exist in a particular setting and at a particular time. (Italics supplied.)

Matter of Business Size

The question of the size of our business enterprises is frequently mentioned with concern. Of course, there is no doubt that the size of the industrial units essential to a strong economy has increased very substantially in the past 50 years and will increase even more substantially in the future. The reason for this growth is too well known and too well accepted to be open to debate.

Business units, whether concerned with nylon or news, must be large enough to support the scale of activity to which they are dedicated, and that scale is never static, but increases continually with technological growth and improved living standards.

Modern society, leaning so heavily on technology, simply cannot exist without many large units. As our technological horizons broaden and increase in complexity, the demand will be for increasing rather than decreasing aggregations of talent, manpower, and resources.

Social Pressures on Business

I view this with satisfaction, not with alarm, for the pressures of society will inevitably produce their own controls and stabilizers.

(Please turn to page 63)

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Rely on Graybar...

ESPECIALLY IN EMERGENCIES

Graybar's long experience in serving the every day needs of telephone companies is especially valuable when lines go down.

A nation-wide network of Graybar offices and warehouses provide ready accessibility to stocks of essential telephone supplies. You can depend on the fastest possible deliveries of emergency replacement items — wherever and whenever they are needed.

Experienced Graybar personnel have developed the know-how needed to initiate immediate action and efficient follow-through from working closely with telephone companies daily and through emergencies of all kinds.

Moreover, Graybar is totally owned by its operating and retired personnel. That's why you're sure to get, especially on emergencies, *personal* service from people who have a *personal* interest in giving you the assistance you need, when you need it.

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today's

Highlights

of finance-taxes-business trends

by Willard F. Stanley

BOND COSTS RISE AGAIN: Last month we were able to report some improvement in utility bond yields after the peaks experienced in late August. But, another price reaction has set in and in the past month, most of the indicators point to reversal of the favorable trend. The recent bond issue of Public Service of New Jersey (rated double A) was offered on more than a 4.3 per cent basis—high by any standards. Furthermore, our Wall Street Journal tabulation of 14 new utility bond issues showed (on Nov. 13) average yields on bid prices more than 11 decimals (.11 per cent per annum) higher than the average yields indicated by original offering prices. A month previous this differential was only .025 per cent per annum, or 2½ decimals. At that time, higher and lower yields were about equally divided, but the recent tabulation shows nine increases in yields and only five cases where yields were lower than on the initial offering.

A minor favorable factor is that after Nov. 15 there is a dearth of utility bond offerings for the balance of that month—only two issues, aggregating 13.5 million dollars. This might give the utility bond market a needed breathing spell. But we hear that private placements are increasing vastly, and this form of funded debt supply may well offset any lessening in the schedule of public offerings.

In December a substantial schedule of utility bond offerings is resumed, with about 115 million dollars now in line for placement.

Industrial issues loom heavy (215 million dollars) in the last half of November, principally because of the 170-million-dollar Sinclair Oil debenture offering, slated for subscription by stockholders. In December, offerings of industrial and commercial corporations fall back to 77 million dollars (according to Investment Dealers Digest), but this figure will probably be augmented later, since industrial offerings are not usually scheduled in advance with the precision of utilities.

Turning to other categories of money rates, we find continuance of the upward tendency. Acceptance rates have been raised and treasury bill rates have again pierced the 3 per cent level.

All in all, the outlook seems to be for continued "tight" money in almost every category with a steady to somewhat higher yield on utility funded debt in the near future. Given these circumstances, there seems no justification for delaying utility debt financing where the funds are required soon. If the money needs don't arise until well after the turn of the year, then there appears to be no reason to accelerate the offering. Much may happen in the next six months—most of it presently unpredictable. We are inclined to adhere to the belief (perhaps "hope" is a better word) that the present interest rates are at such a relatively high level as to make the odds favor some amelioration on a long-range basis.

(Please turn to page 28)

Mr. Stanley, formerly financial vice president of Southwestern Public Service Co., an electric utility with over 160 million dollars in assets, is president of Corporate Services, Inc. of New York City. He is a member of Controllers Institute of America and New York Society of Security Analysts. He serves on three committees of the Controllers Institute having to do with federal taxation, social security and finance management. His articles are appearing once a month in TELEPHONY.

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3 BENEFITS a FITCHBURG CHIPPER brings to your line clearance operation

New Jersey Bell Telephone, Vineland, praises Fitchburg Chippers

NEW JERSEY BELL TELEPHONE COMPANY

17 LANDIS AVE.

VINELAND, N. J.

S. B. DUBIVSKY
DISTRICT PLANT SUPERINTENDENT

July 28, 1955

Mr. W. O. Forman, President
Fitchburg Engineering Corporation
Fitchburg, Mass.

Dear Sir:

Line clearance work in this part of New Jersey is of such proportions that disposal of brush is a continuing problem of expense and maintenance of good public relations.

We are glad to report that, in our opinion, the Fitchburg Chipper does the job at low cost and eliminates many of the problems which accompanied the loading, hauling, dumping or burning of brush and cuttings.

Chipping, as a method of disposal, has produced a favorable reaction in the attitude of governing bodies and the general public which we hope will continue to operate to our advantage in securing and maintaining line clearance.

The chipper has also produced an important dividend in the reduction of possibility of accident arising from multiple handling and disposal. In this connection, we are favorably impressed with those design features of the Fitchburg Chipper which provide for the safety of operating personnel.

Very truly yours,

S. B. Dubivsky
District Plant Superintendent

sbd-a

FITCHBURG ENGINEERING CORPORATION

FITCHBURG, MASSACHUSETTS

You'll be interested in how the 3 big Fitchburg Chipper benefits listed below apply to your operation. Read what New Jersey Bell Telephone, Vineland, says about their experience.

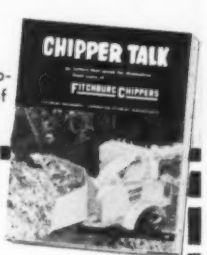
1. **Low cost brush disposal.** Fitchburg Chippers help get your line clearance job done with fewer men, less equipment, less cost. No more loading, hauling, dumping, burning. Chips are blown to side of road or right of way.

2. **Good public relations.** Wood chips provide a neat, organic soil dressing that stays in place—helps keep up roadside appearance, keep down weeds. Where chips cannot be left on job-site, most crews give chips to the nearest farmer or gardener for use as valuable mulch.

3. **Safety in operation.** The Fitchburg Safety Spring, or spring-loaded feed plate not only assures equal ease in chipping all sizes of wood to the machine's rated capacity; it also provides an added safety factor—aids in protecting the operator in case metal or foreign material is accidentally fed into the machine.

NEW FREE BOOKLET

Complete cutaway color drawings, photographs, specifications, and photo copies of letters from satisfied users.



FITCHBURG ENGINEERING CORPORATION

Fitchburg, Mass., Dept. T-126
Send free copy of "Chipper Talk" to:

Name.....

Position.....

Company.....

City or Town.....State.....

EQUITY MONEY FROM COMMONS: Utility common stocks continue to hold quite steady, with price-earnings ratios and dividend yields favorable to issuers, in most cases. So we continue to voice the view (by now monotonous) that this kind of money should be raised promptly wherever it is expected to be needed within the forthcoming year or so.

* * * *

STOCKS SHAKY: The stock market has been singing the "international blues" for the past month. Election uncertainties are over, but the outcome was substantially "discounted," marketwise, before the event. Meanwhile the nation is confronted by the most serious combination of foreign developments in several years. To the uncertainties of the Middle East have been added the intervention of Russia in Hungary. As this is written, things look fairly well in hand, but even at the best it seems wishful thinking to expect the Middle East situation to be resolved promptly and favorably.

The factors involved are so numerous and complicated that a protracted period of alarms and uncertainties is definitely indicated—even though the final outcome should be innocuous.

As an indicator of how stocks have slipped on the foreign fears, the New York Times average of 50 combined stocks showed (at Nov. 20) a level 4 per cent below the year end of 1955. This indicates a drop from the averages shown at Oct. 26 and Sept. 21, both of which were approximately equal to that at Dec. 31, 1955.

* * * *

THE BUSINESS TREND: Earnings for the third quarter—ended Sept. 30—point to a levelling off of profits. Some time back we noted the spottiness of corporate earning reports, with many smaller companies showing lower income than in like 1955 periods. First National City Bank of New York reports that third quarter earnings of about 700 corporations are down 9 per cent from last year.

But this result reflects heavy comparative losses in the steel and automobile industries, due to strikes and curtailed production. If these two industries are eliminated, the quarter earnings would have shown an increase of about 6 per cent.

About 57 per cent of the companies reporting showed increased earnings for the period, but this is substantially less than the 75 per cent to 80 per cent of indicated improvement in income for earlier quarters.

Most significant seems to be the trend toward reduced profit margins. While sales improve, profits gain but little. For example, the bank reports only 6.4 cents of the sales dollar was carried down to income by these companies for the third quarter of 1956, as compared with 7.5 cents in the same quarter of 1955. This means that sales have to improve about 12 per cent to maintain profits at previous levels.

These indicators, plus foreign uncertainties, advise caution in all stock market commitments.

* * * *

FEDERAL TAXES—REGULATIONS: In an address before the Wisconsin Society of Certified Public Accountants, Internal Revenue Commissioner Harrington said that all 1954 Revenue Code regulations will be issued "in the near future." Regulations for only 60 per cent of the 134 specific categories into which the code provisions were divided have been published either in final or tentative form, leaving quite a few regulations still to be heard from after 27 months from the date the code was adopted.

Among the missing regulations are those covering changes in accounting methods —such as cash to accrual basis, method of valuing inventories, etc. Taxpayers who applied back in 1954 for permission to change are still awaiting treasury approval. We understand this won't be forthcoming until regulations are issued.

Meanwhile, taxpayers making the change must continue to report on the old method for tax purposes, thus creating additional work, expense and uncertainty.

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CLOSE-UP OF A Grasshopper

Used by the Telephone Switchboard Manufacturers for the past fifty years, this effective fuse is now being specified by electronic and computor engineers.

Small in size, simple in construction, accurate and positive in operation in terms of current rating, operating time and ground or alarm switching.

Aptly termed over the years by the trade "Grasshopper" Fuses because of their appearance and animated release. Made to eighteen standard ratings varying from .18 to 5.0 amperes, voltages up to 160 volts, from 1½ to 5 minutes operating time and slotted for No. 6 and No. 10 screws. Also made to customer specification when required. When specified, the fuse wire is sheathed in glass tubing.

Samples furnished on request.

COOK ELECTRIC Company
Since 1897

2700 SOUTHPORT AVENUE CHICAGO 14, ILLINOIS

THE Plant Man's Notebook

BY RAY BLAIN, TECHNICAL EDITORIAL DIRECTOR

THE FOLLOWING is quoted from a most interesting letter we received from Mr. J. N. Johnson, president and general manager of the Inter-County Telephone & Telegraph Co., in Ft. Myers, Florida:

"Your notes in TELEPHONY are always enjoyed, but having reviewed the Oct. 20 issue and noting your paragraph on 'contractions,' I had the impulse to write you because of the feeling I have always had against contraction of the word 'telephone.'

"After being a telephone man for a great number of years and being somewhat of the old school, I finally began to broaden my thinking about several matters in order to be able to keep pace with present-day trends as they pertain to advertising and publicity.

"I have always resented the abbreviation of the word 'telephone' to 'phone,' but as you indicated in the changed thinking of the Coca Cola Company, I have finally adopted a contraction that has gone over big locally by contracting the word 'telephone' to 'fone'."

We agree with Mr. Johnson wholeheartedly. If we cannot say "telephone," then lets make it "fone."

•

The meanest man we have ever heard of is the one who disguises his voice and answers "Union Station" when the telephone rings with annoying frequency. Callers, even friends, think they have the wrong number and hang up. Certainly this doesn't contribute to good telephone service.

•

We have always contended that drafting costs too much money and now we have learned a few short cuts that should reduce the cost considerably.

For example, the title block requires considerable time of the draftsman to draw. This block, printed to your specifications, on a clear plastic sticker, can be attached to the underside of the tracing. The necessary data can be filled in quickly by a draftsman.

Also, drawings must often be marked "Preliminary" in big letters until final approval is received. This too can be accomplished by the use of a sticker on the tracing that can be removed easily and quickly when permanent drawings are to be printed.

•

We enjoyed a visit in Washington, D. C., recently with George F. Klein, administrator, communications and utility rates, facilities administration, Radio Corp. of America, Camden, N. J.

The telephone system designed to serve RCA at this location consists of a main PBX and six satellites. A universal numbering system is used so that the directory numbers are the same from all stations. Tie lines connect this system with other RCA plants throughout the country.

In our opinion this is one of the most efficient telephone systems we have ever seen. There is no doubt that telephone service can be made more valuable to any concern by making certain that it is properly planned.

•

We enjoyed a visit also from our good friend Bill Channell of El Monte, Cal. Bill showed us a 30-minute color movie with sound that depicted the installation of his cable terminal and his cable lashing method without a lasher.

With this method the lashing wire is made up in coil springs that are placed on the messenger strand. The spring expands as the cable is pulled through the span.

•

We enjoyed a conversation with J. R. Kershaw, engineer of plant extension and outside plant, at Ft. Monmouth, N. J., the other day. Mr. Kershaw is doing his annual stint as a reserve officer in the Signal Corps.

He gave us some interesting information on the use of buried cable by his company. Also the use of dial switching systems installed in trailers to provide telephone service quickly in new housing projects.

•

We spent an afternoon in a conference room recently that was provided with a telephone but the conferees were not bothered by the ringing bell. This set was equipped with a light that flashed when anyone called. A switch was provided so that the bell could be connected if required.

•

We have read various reports in the press of late about the Bell System picture-phone system that transmits recognizable pictures over an ordinary voice circuit. It is admitted that this system is still undergoing development and evaluation and is not ready for manufacture or commercial use.

The *American Weekly* reports that they printed the following story on June 3, 1906, about a "seeing telephone" invented by J. B. Fowler of Portland, Ore., and tested over a distance of more than 6,000 feet. It stated: "The televue will revolutionize the conditions of modern life, perhaps even more than the telegraph or the telephone.

"With the simple telephone it is difficult to buy goods with confidence because naturally one wishes to see them before buying. But this difficulty will be removed by the televue.

"It will simplify the task of the housewife enormously. She will be able to buy dress goods and provisions and do all her shopping by televue. The salesgirl will hold up the article desired before the televue transmitter and say: 'How will this hat suit you Madame?' "

•

Alfred Vail Hall houses the Post Communications at Ft. Monmouth, N. J. This building was dedicated on the 96th Anniversary of the U. S. Army Signal

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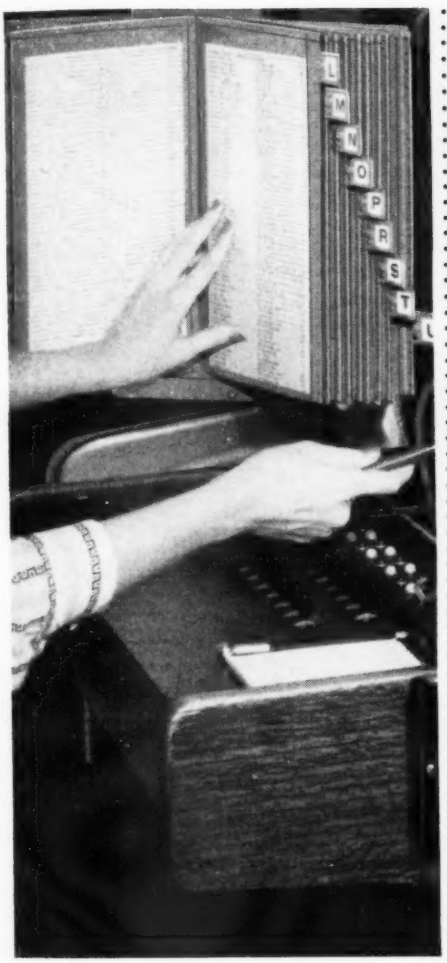
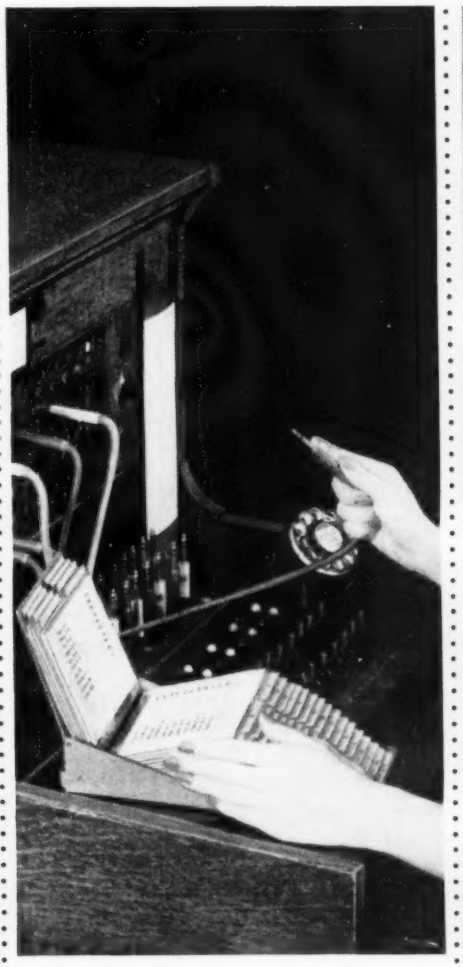
Keep Important Information at their Finger Tips...ALWAYS





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Operation of your PBX installation can be immeasurably improved by making available to your subscribers Remington Rand **Speedac Chaindex** Reference Units. These exclusive KEY SHELF DIRECTORY UNITS for telephone numbers and extensions are specifically designed to speed subscribers' service and ease the operator's duties.

With **Speedac Chaindex**, fast reference to any of 1040 lines of information is made with a flip of the pocket. Removal or replacement of information can be made instantly without disturbing the order of the other lines. **Chaindex** cards feed into typewriters or addressing machines easily. **Speedac Chaindex** is compact — 5½ x 10¼ inches.

SPEEDAC® Multi-Card

Long distance calls are handled with greater speed and accuracy... lost time due to trunking to another information source is eliminated... and rate and route information is instantly available to operators handling long line switchboards, thanks to **Speedac** Multi-Card. This compact Bulletin Holder Unit makes these things possible by completely listing day and night rates for both person to person and station to station calls... route information... toll centers and other frequently called points. A flip of a pocket is all that is necessary for speedy reference and with Multi-Card changes can be made quickly when information revisions are necessary.

For further information on these fine products send for free folders KD767 and KD734.
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Corps on June 21, 1956. Many old timers of World War I will remember when Ft. Monmouth was known as Camp Alfred Vail.

Alfred Vail, inventor and pioneer in telegraphy, was born in Morristown, N. J., on Sept. 25, 1807. He was closely associated with Samuel F. B. Morse in his telegraph experiments.

He died on Jan. 18, 1859, at the early age of 51. The telegraph, to which he had applied his inventive and mechanical genius, was the forerunner of today's complex communications systems, and although he died prior to the establishment of the U. S. Army Signal Corps, his achievements greatly influenced the methods by which the Corps was "to get the message through."

•

The *Indiana Telephone News* states that of the 167,000 farms in the Hoosier state, it is estimated that a 50 per cent development of extension telephones is possible. Many farmers have discovered that extension telephones — in barns and farm buildings—have aided in better farm management.

•

The Chesapeake & Potomac Telephone Co. has chosen Richmond, Va. for a field trial of the new dry air method of exchange cable maintenance. The Virginia company has over 8,000 miles of exchange cables, ranging in size from 11 pairs to 2,121. As many as 6,000 to 8,000 telephones working in a single cable could be affected by a single case of trouble.

The new pressure system works something like this: dry air supplied by the compressor dehydrator is pumped into the cables at the central office, and is maintained at a pressure of 9 pounds.

Pressure gauges are located at strategic points along the cable route and are connected to an alarm circuit. If a break occurs in the cable sheath, a drop in pressure will develop, which in turn operates the pressure gauge and sets off an alarm at the control center. A troubleman is then dispatched to locate the break. This is accomplished by making a series of pressure readings along the route and preparing a graph chart which indicates the location of the break within a few feet.

The actual break is located by use of a mechanical device that is pulled along the cable and sprays it with a soap-like liquid. When the spray passes over the opening, escaping air from the pressurized cable causes a foam-like action that is visible from the ground. When the opening is repaired, pressure on the cable is restored to normal.

Plant Man's QUIZ

By RAY BLAIN, Technical Editorial Director

Q. Will it be possible to use compressed air or must we obtain nitrogen gas to test an old cable with the so-called bubble bath method?

A. It is assumed that you refer to the method of spraying a liquid on a cable that is under pressure so that all leaks may be detected. Dry air can be used for this purpose just as satisfactorily as nitrogen gas if the proper pressure is used so that all leaks, even the small ones, may be detected.

•

Q. Will you please explain how we may build a howler to use on party lines when subscribers leave their receivers off the hook.

A. We do not believe that local fabrication of a device of this nature would prove satisfactory. It is suggested that you procure a properly designed and constructed howler from your telephone supply house.

The tone produced by one such howler is distinctive, demanding attention. It is loud, yet safe. Once the howler is placed on the line, the subscriber, if at home, cannot fail to hear the signal tone, and will persist in searching for this unusual sound until he discovers its source.

This howler tone starts at a high frequency with a low amplitude, increasing in strength slowly. This feature provides time for anyone who happens to have the receiver to the ear to take it away before the sound becomes loud enough to prove painful.

•

Q. Would you please tell us what precautions may be taken to prevent linemen from poison ivy infection?

A. The only sure preventive that we know of is to keep away from all poison ivy. We realize that this is not always possible for a lineman. If possible, the parts of the body that come in contact with poison ivy should be thoroughly washed with a good soap and hot water as soon after contact as possible.

A poison oak, ivy and sumac ointment is available as a part of some first-aid kits that may be used as a preventive and treatment of these infections.

•

Q. What is the Decimonic System of selecting ringing as used on rural lines?

A. This system derives its name from the 10 cycle spacing between ringing frequencies which are 20, 30, 40, 50 and 60 cycles.

This system also offers a freedom from cross-ring and frequency drift.

•

Q. Will heat be required in an unattended automatic exchange located where temperature drops to 0° F., occasionally?

A. In our opinion, heat is required at least for use when maintenance men are on duty in the exchange making routine tests or clearing trouble. While it is true that automatic equipment will generally operate satisfactorily over a temperature range from 0° to 100° F., storage batteries will also start to lose their reserve capacity at about 15 degrees F.

In general, a safe type of regulated heat to maintain a temperature range between 15 degrees F., and 35 degrees F., will prove satisfactory for an unattended automatic exchange.

•

Q. What type of wire is considered best suited for the buried type of construction on a rural line?

A. Various types of wire, both armored and unarmored, are presently being used experimentally on rural line construction projects. One type of wire is insulated with a low absorbing rubber compound. The insulated conductors are covered and protected by a served armor of flat steel wires and a tough, abrasion-resistant jacket of neoprene.

Another type of wire designed for direct burial has an armor of fairly heavy copper.

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URBAN DISTRIBUTION WIRE

No. 24 Copper — Color Coded Polyvinyl insulated Conductors cabled around galvanized steel messenger. Available in 16 pairs only. No. U.D.C. - 1619-U.

Contact us for name of nearest distributor.

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No. 22 Bare Copper Triplex Brown or Ivory
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No. 19 Bare Copper Triplex Brown or Ivory
No. 22 Bare Copper Tw. Pr. Jacket Overall Brown or Ivory
No. 22 Bare Copper Triplex Jacket Overall Brown or Ivory

JUMPER & SWITCHBOARD WIRES

No. 22 Tin. Copper Tw. Pr. Red and White
No. 22 Tin Copper Triplex Red-Black-White
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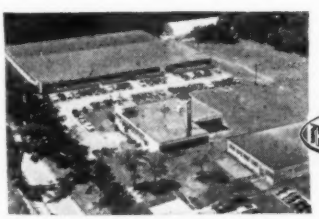
16 pr. No. 24 B.C. — Overall PVC Jacket O.D. .420
21 pr. No. 24 B.C. — Overall PVC Jacket O.D. .490
26 pr. No. 24 B.C. — Overall PVC Jacket O.D. .520
51 pr. No. 24 B.C. — Overall PVC Jacket O.D. .710
76 pr. No. 24 B.C. — Overall PVC Jacket O.D. .830

RURAL DISTRIBUTION WIRES — REA APPROVED

Polyethylene insulated — color coded polyvinyl jacketed conductors. 19 insulated conductors cabled around steel messenger. 3 pr., 6 pr., 11 pr., 16 pr.



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THE Operator's Corner

By MAYME WORKMAN — TRAFFIC EDITOR

ON THIS LOVELY Sunday afternoon, when many people are out enjoying the sunshine, I am seated at my typewriter wondering, "What shall I write about?" To write effectively, one must be in the mood. I am usually "in the mood," for to me writing is like having a visit with my friends in the telephone industry throughout the nation.

As executive secretary of The Independent Telephone Pioneer Association, I frequently find a personal note tucked in with the member's payment for membership dues, commenting upon "The Operator's Corner." You may be sure these comments are always acknowledged, no matter how busy the day may be. A word of appreciation works wonders. It lends encouragement and inspiration, particularly at a time when the pressure of work is exhausting.

Telephony is an endless topic and one should never be at a loss for material to speak or write about. It is an ever-changing industry which is a challenge to everyone engaged in it.

At a Toll-Center Tributary meeting held in Freeport, Ill., recently, which the writer was privileged to attend, it was revealed that many changes in toll operating practices were soon to be introduced. That will entail preparation of study material, retraining of the entire operating force in the new and revised practices, etc. There is no standing still in this business.

What will the telephone be like 50 years from now? According to Mr. A. L. Charney, writing in "The Telephone News," published by the Bell Telephone Co. of Pennsylvania, it will be mighty intriguing. He predicts that Tomorrow's telephone will be a distant-talking, loudspeaking set with a flat screen. It will look something like a small camera that has a flash bulb attachment. To reach another person, you will flip a switch and announce the number you want. When the called person answers, you will see his or her face on the screen above the instrument and hear the voice of the receiver.

When you receive a call, you will hear your telephone buzzing. (There will be no bell. The receiver itself will signal you.) You will throw a switch and be ready to talk—to see and be seen. Luckily, only the face will be visible or we might be embarrassed on some occasions.

Suppose you are away from your home or office. Then you will carry with you a pocket radio-paging receiver which buzzes to tell you that you are wanted. You can then go to the nearest public telephone and check with home or office.

What about present numbering problems? By 2005 they will all be solved. At birth each child will have a 13-figure number assigned to him for life; it might well be tattooed on his arm. If you know his number, you announce it on your instrument—and you reach him. If he does not answer in a reasonable time, an intercepting device will announce the reason. Perhaps it will even announce, with appropriate sympathy, that he is no longer among the living.

The telephone central office will be a lot different from today's. Of course, it will still have cables and frames, but none of today's mechanisms. Semiconductor devices—diodes, thermistors, transistors—will do all the switching and all the control without noise or fuss, and in a small fraction of a second.

The toll office will have even more diodes, triodes and istors of all kinds. Switchboards will look like modern desks. Cords will have completely disappeared. All the mechanical tasks will be performed by the machines. Ticketing, timing and setting up the connection. More operators will be free to devote themselves entirely to customer service.

All of the above predictions are actually based on methods and apparatus whose beginnings are already in the telephone plant today or are being tested in the Bell Telephone Laboratories at the present time. (Taken from June-July Edition of "Exide Topics").

If the foregoing sounds fantastic, we need only review some of the things which have become commonplace in the telephone industry in the past few years to realize what appears fantastic today may well be commonplace tomorrow.

At the meeting in Freeport, off the record we talked about some of the obsolete operating practices which in their time were felt to be the last word in Telephony: making two tickets on all collect calls, green WH report tickets, and many other practices which younger operators of today never heard about.

And so we move along, ever ready to try our wings on some new practice, introduced to improve the efficiency of telephone service and make it more pleasing to the customer.

Traffic Questions

(1) If the customer indicates initially that he wishes the telephone numbers of more than one subscriber, what action should be taken by the Information operator?

(2) If a customer requests the telephone numbers of not more than five subscribers, should the information be given and, if so, how should the Information operator proceed?

(3) If a customer requests the telephone numbers of more than five subscribers, what action should be taken by the Information operator?

(4) What action should be taken by the supervisor when an operator refers a customer to her who desires the telephone numbers of more than five subscribers?

(5) When an operator refers a customer to the supervisor who insists upon obtaining the number of a nonpublished telephone, how should the supervisor proceed?

Answers are presented on page 80.

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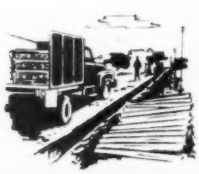
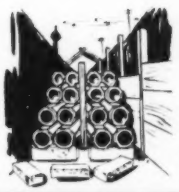
An 8-tier run of Soapstone OCT-O-DUCT provides a new telephone link down hard-rock Nob Hill to colorful Chinatown in San Francisco.

YOU CAN ACTUALLY SEE SOAPSTONE DUCT SAVE YOU MONEY



1 Trenchside delivery of Soapstone OCT-O-DUCT eliminates field inventory problems and makes certain your duct is at your job when you need it.

2 OCT-O-DUCT's convenient 4-foot lengths can be quickly installed by 2-men crews even in narrow and deep trenches.



3 OCT-O-DUCT's exclusive, flat-sided design eliminates the need for expensive interlayer spacers. Duct will not roll.

4 OCT-O-DUCT is connected in the trench with easy-to-apply circular couplings making possible fast, rhythmic, production-line installation.

The many time- and work-saving features of Soapstone OCT-O-DUCT and full information on the sizes, bends and accessories available from this 30-year-old Company are contained in our Catalog and Installation Manual. For your FREE copies, drop us a note on your letterhead.

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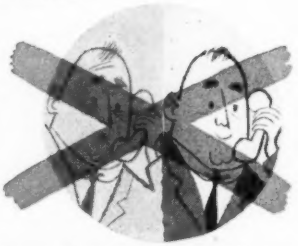

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Section 26 (continued)

Your job as PBX Service Adviser is a very important one. You can do a great deal to generate cooperation, and your success as a leader depends almost wholly on the way you go about getting this cooperation. The fortunate part of any supervisory work is that cooperation is rather enjoyable to most people.

Working with PBX attendants is one way of helping you to analyze your methods of securing cooperation and also gives you a closer and a longer look at the people you are supervising. If you are to decide what you should do to help you reach the goal you set for yourself, you need to take off your rose colored glasses and view yourself and your PBX people through clear vision.

Whether you work with 100 persons or only one, it is most important that you know how to work with people. Speak in simple language—that means treating your PBX people in a way that will make them want to do a good job and get satisfaction out of the doing. Some supervisors do not take the time or have the patience to treat people as they would like to be treated. That is why learning how to deal with people is one of the shortest roads to success. But, it has a benefit far more important to you than qualifying you for a better job—it brings you a great deal of personal satisfaction and makes your work more pleasant and much easier.

Your entire success as a Service Adviser, your ability to sell your PBX attendants on the importance of their work, will be governed by your interest in your job. The performance of most PBX attendants will be only as good as the supervision under which they work. You will get just as much out of your job as you contract for. Unselfish effort will bring self-satisfaction in the knowledge that you have done your best.

There is little new in these notes. The objective has always been to develop pleasing service to the PBX customer. So, it won't be strange if we turn to principles instead of a set of rules for working with our PBX people.

Really, there is no secret to dealing with people successfully. It simmers down to simply this—the more care you use the more likely you are to hear a PBX attendant say, "Miss _____ is a good

Service Adviser. I enjoy having her call at my switchboard."

You want all PBX attendants to be happy and satisfied in their job, of course. You want them to be interested and to look forward to coming to work. You don't want their happiness to stay hidden, you want it to show in their faces and in the work they do. In other words—you want them to give good service because they want to give it.

The Difference Between Doing the Job Ourselves and Assisting Others to Do It

The PBX attendant has the responsibility to give her company's customers and extension users as accurate, courteous and fast telephone service as possible. She has a position of a switchboard to take care of. Your responsibilities as a Service Adviser go much farther than that. Instead of one PBX to take care of, you may have many. Of course, you do not give service direct to the calling party; instead, it is given through the PBX attendants you supervise.

These points are very important. Suppose you were unable to understand the significance of the differences. What do you suppose might happen?

For one thing, you could become over zealous and try to help the attendant operate her switchboard, not stopping to realize that it is one thing to be able to do the job yourself, but an entirely different matter to explain it understandingly to someone else.

PBX attendants do not like to have anyone interfere with their equipment and it certainly would not be a good practice if some of them condoned it. You certainly wouldn't help matters by such procedures. You can't make an attendant self-reliant by taking over her job.

But, you can help her build up confidence in herself by encouraging her to go on in her efforts, in spite of the difficulties she may meet. Let her know when she makes progress—tell her about the good job she is doing, commend her now and then.

Do not get the idea that it is easier and quicker to do things for the operator than it is to teach her how to do them. When she runs into difficulty and asks for help, do not take the situation away from her, instead explain how to handle it. Certainly, there will be the occasional case where you feel that due to the importance of the situation or emergency, it should be handled by a more experienced person, or by yourself, but when such a case shows

up, be sure to give the attendant the reason why. If you don't she will feel you have no confidence in her.

Once you become a supervisor and assume responsibility for work done by others, there are three roads open to you:

(1) You can become a dictator—be exacting, demanding, too critical and too strict—expecting a PBX attendant to do as you say, whether she knows the reason why it is necessary or not. You can take the attitude that a PBX attendant is going to adhere strictly to the rules or else. You can be guided solely by the book.

(2) You can follow the road of least resistance, giving up easily when the going gets a little rough. You can allow careless or lax work. You can allow a poor tone of service. You can look the other way at poor technique. You can pass by the attendant being indifferent toward her job.

(3) You can follow the path of good leadership. You can set a good example of industry, and show a sincere interest in each of your attendants. You can help them like their work and want to do a good job. You can make them feel that they can ask and will be given help whenever it is needed.

You get results through people; remember this and work toward the idea that one of the most important parts of any business is the people responsible for telephone service. Try to instill in the PBX attendant the feeling of pride that comes with a job well done. Attendants are human beings and they do not work in the same precise way equipment does. Try to understand this and learn to know each one of your PBX attendants, their ideals and their ambitions.

Knowing Yourself

To be a top flight leader, you must know and understand each one of your PBX people. What is more—you must know and understand yourself. Once you learn to understand yourself, understanding others will be comparatively simple.

Some people overestimate what they can do, while others underestimate their capabilities. On occasion, a person can rise to achievement heights in a way hardly believed possible. Once you, as a Service Adviser, realize your own difficulties or shortcomings, you will become tolerant of others.

(Section 26 to be continued next week)

Trunk Economy

Through Selector Bank Grading

By DAVID L. HOGAN

ALMOST without exception the most expensive single item of telephone plant is the trunk. Regardless of type, tie, operator, information, satellite, or other types of trunks, especially in extended scope systems, miles of line and sometimes complicated carrier equipment are involved in providing a single conversation path which, on the average, is the most costly that must be provided in the modern telephone system. To achieve maximum economy each trunk must carry the maximum possible traffic.

The optimum situation would be to have a new call established over a given trunk immediately upon termination of the previous call. However, this is not a practical arrangement and mathematicians have evolved tables for us by which the number of trunks required to give a particular grade of service may be determined.

Mr. Hogan is a project engineer of U. S. Air Force Engineering Agency in Mobile, Ala., and is a registered professional engineer in Alabama.

Once we have determined the number of trunks required, our next job is to distribute them over the selector bank which will access them so that each trunk will carry the same traffic, and, therefore, for a given grade of service, the group as a whole will carry the maximum traffic.

It has been determined that traffic will distribute over Strowger type selector banks, for example, in the following percentages:

First choice	19.5 per cent
Second choice	18.1 per cent
Third choice	16.2 per cent
Fourth choice	14.0 per cent
Fifth choice	11.3 per cent
Sixth choice	8.5 per cent
Seventh choice	5.8 per cent
Eighth choice	3.6 per cent
Ninth choice	2.0 per cent
Tenth choice	1.0 per cent
Total	100.0 per cent

Consequently, trunks should be distributed in these same percentages, resulting in an equal handling of traffic by each trunk. Certain "standard" grading schemes are available which apparently were designed around the principles mentioned above.

However, for the sake of simplicity, these schemes use a common distribution pattern over a wide range of trunks and the per cent distribution pattern seems to apply only to the high-end of the range of trunks.

Perhaps some of the reasoning above has been a little technical for other than equipment engineers. Fortunately, however, the application is much simpler and an example is given below.

Let's take the case of 12 local first selector shelves (each consisting of 10 selectors whose banks are in full multiple) from which we wish to grade 30 inter-office trunks from level two. We will make a chart, listing by choice, the theoretical number of trunks required on each, as indicated in *Table A*, and practical solutions, keeping in mind the

(Please turn to page 42)

TRUNKS / Choice	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	2.15	2.35	2.55	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	4.3	4.5	4.7	4.9	5.1	5.3	5.4	5.6	5.85
2	2.0	2.2	2.3	2.55	2.7	2.9	3.1	3.3	3.5	3.6	3.8	4.0	4.2	4.4	4.5	4.7	4.9	5.1	5.3	5.5
3	1.78	1.95	2.1	2.3	2.4	2.6	2.8	2.9	3.1	3.3	3.4	3.6	3.7	3.9	4.1	4.2	4.4	4.6	4.7	4.85
4	1.5	1.68	1.8	2.0	2.1	2.3	2.4	2.5	2.7	2.8	3.0	3.1	3.3	3.4	3.5	3.6	3.8	3.9	4.1	4.2
5	1.25	1.36	1.5	1.6	1.7	1.8	1.9	2.0	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.1	3.2	3.3	3.4
6	.93	1.0	1.1	1.2	1.3	1.4	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.0	2.1	2.2	2.3	2.4	2.5	2.55
7	.65	.71	.77	.83	.89	.95	1.0	1.1	1.1	1.2	1.2	1.3	1.4	1.4	1.5	1.5	1.6	1.7	1.7	1.78
8	.4	.43	.47	.50	.54	.58	.61	.65	.69	.72	.76	.79	.83	.87	.90	.94	.97	1.0	1.0	1.08
9	.22	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	.6
10	.11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	.3

TRUNKS / Choice	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
1	6.0	6.2	6.4	6.6	6.8	7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0	9.2	9.3	9.5	9.8
2	5.7	5.9	6.0	6.2	6.4	6.6	6.7	6.9	7.1	7.3	7.5	7.6	7.8	8.0	8.2	8.4	8.6	8.7	8.9	9.1
3	5.0	5.2	5.4	5.5	5.7	5.8	6.0	6.2	6.3	6.5	6.6	6.8	7.0	7.1	7.3	7.4	7.6	7.8	7.9	8.1
4	4.4	4.5	4.7	4.8	4.9	5.0	5.2	5.3	5.5	5.6	5.7	5.9	6.0	6.2	6.3	6.4	6.6	6.7	6.8	7.0
5	3.5	3.6	3.7	3.8	3.9	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.9	5.0	5.1	5.2	5.3	5.4	5.5	5.6
6	2.6	2.7	2.8	2.9	3.0	3.1	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.7	3.8	3.9	4.0	4.1	4.2	4.2
7	1.8	1.8	1.9	2.0	2.1	2.1	2.2	2.2	2.3	2.4	2.4	2.5	2.5	2.6	2.7	2.7	2.8	2.8	2.9	3.0
8	1.1	1.15	1.2	1.2	1.26	1.3	1.33	1.36	1.4	1.44	1.5	1.5	1.54	1.6	1.6	1.7	1.7	1.7	1.8	1.8
9	1	1	1	.6	.70	.72	.74	.76	.78	.80	.82	.84	.86	.88	.90	.92	.94	.96	.98	1.0
10	1	1	1	.34	.35	.36	.37	.38	.39	.40	.41	.42	.43	.44	.45	.46	.47	.48	.49	.50

Table A—Theoretical numbers of trunks

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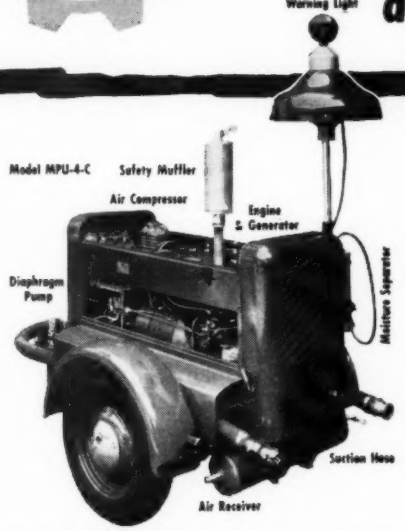
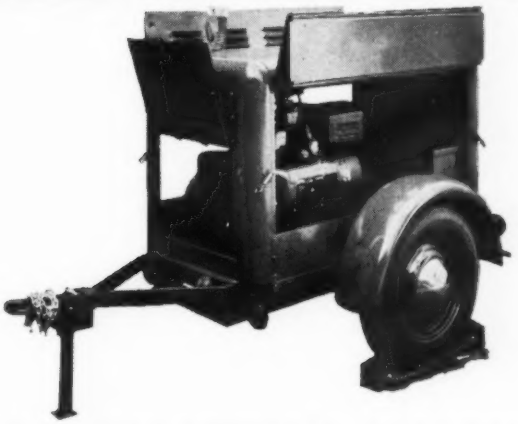


MOBILE POWER UNIT (Model MPU-4-C)

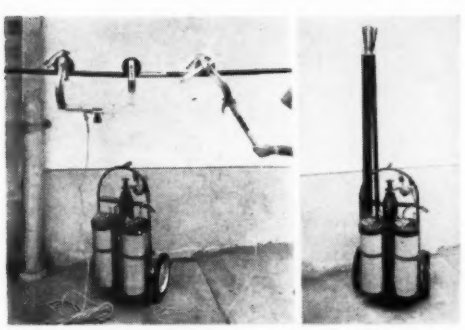
• Generator (slow speed for quietness) 2500 Watt, 110-Volt DC • Pump—2800 GPH Diaphragm to remove seepage and drain back.

• Air Compressor—to put cables under pressure for cutovers or repairs. *Furnished with or without pump and compressor.* This unit is extremely versatile and very dependable. It has a 300-Watt floodlight, push button control, buzzer signal, supplies dry air, operates electric blower, soldering pot and iron, electric and air tools—is light, easy to handle.



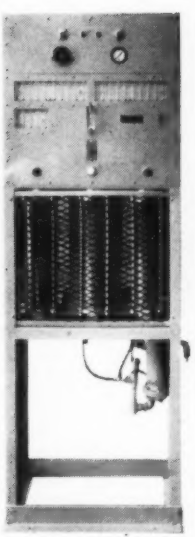
MAINTENANCE GENERATOR (Model T-300)

Used for maintenance or standby service. Equipment includes tool box, fuel tank, safety chain & chocks, tail light & reflectors and sheet metal house with hinged sides, hinged front cover. Trailer is available with or without generator. Approximate size: 92″ long, 53″ wide, 51″ high. With the generator, approximate weight is 800 pounds.



LEAK DETECTOR APPLICATOR (Model LD-1 & LD-2)

Both models use highly successful chemical type leak detector. Applicator's dual nozzle sprays both sides of pressurized cable, giving 100% coverage. Bubble cluster forms around leak within minutes and can be clearly seen from the ground. Air pressure bottle in cart supplies regulated pressure in solution tank at all times, can be adjusted for different heights.



ACD AIR COMPRESSOR DEHYDRATOR

Exchange equipment designed for supplying chemically dry air for telephone cables, aerial and underground, this unit can supply as many as 60 cables. Main feature is individual flow indicator for each cable showing volume of dry air consumed per cable per hour.

- Both Automatic and Manual Units available
- All desiccant containers are visual
- Air Purifier to eliminate oil mist
- Incorporates the latest safety devices

for further information on any or all of this equipment . . .

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Here's a real PABX PACKAGE

LEICH'S NEW 40A PABX

Uses standard Leich telephones

Attendant's cabinet smaller than a typewriter

Here's a new PABX package that you and your customers can really get excited about. It offers better PABX service, greater traffic capacity, faster extension of calls, and a variety of service features.

The new Leich 40A PABX is designed after the famous Leich Dial System. It offers dependable all-relay switching in a modern, compact cabinet which will fit in any modern office or plant. It offers a new exclusive attendant's cabinet which extends calls quickly by key pulsing the called number. It uses regular telephone instruments.

This Leich PABX is available for up to 40 telephones with 10 trunks to the main exchange and 6 local links. Local links are not tied up on extension dialed calls to city trunks. All the power equipment is contained in the compact switchboard cabinet.

Write for this new catalogue. It describes all the features of this versatile new PABX. It is written in a way that will explain this service to your customers. Write for it today.

LEICH

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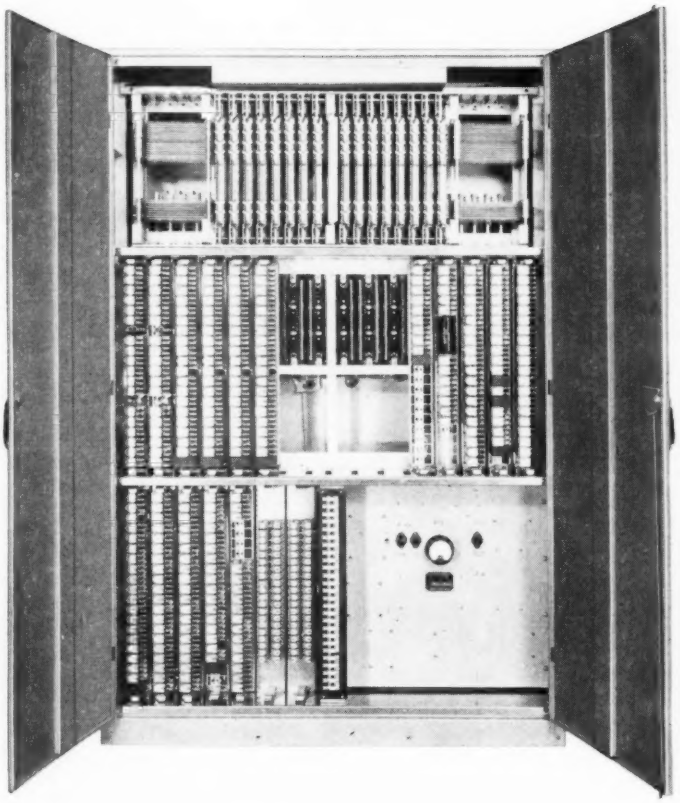

Dependable, compact Leich Dial Switchboard

Here Are Some of the Features Your Customers Will Like

A. Any inside station may call outside without waiting for attendant.

B. Restriction of outside calls if desired.

C. Consultation calls without help from attendant.

D. Quick extension of outside calls to any required telephone.

E. Night answering by any telephone.

F. Inside telephones have two digit numbers.

manufacturers of telephones, switchboards and related apparatus since 1907

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GENERAL SYSTEM INDEPENDENT

number of shelves over which we must distribute the trunks, as follows:

Choice	*Theoretical No. of Trunks (Table A)*	*Practical Solution No. 1*	*Practical Solution No. 2*
1	5.85	6	6
2	5.5	6	6
3	4.85	6	4
4	4.2	3	4
5	3.4	3	3
6	2.55	2	3
7	1.78	1	1
8	1.08	1	1
9	.6	1	1
10	.3	1	1
Total	30.11	30	30

It will be noted that an extra .11 trunk appears in the total of the theoretical number of trunks, which resulted from limiting the number of significant places in each trunk computation. This is not too important since we use no decimal places in the practical solutions.

Two solutions are shown which would conveniently fit the number of shelves with which we are working, however, solution No. 2 is a much closer parallel to the desirable theoretical distribution.

The grading indicated in solution No. 2 would appear as shown below on a distributing terminal assembly.

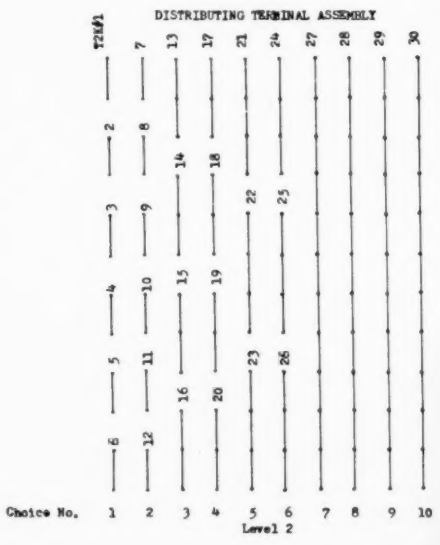
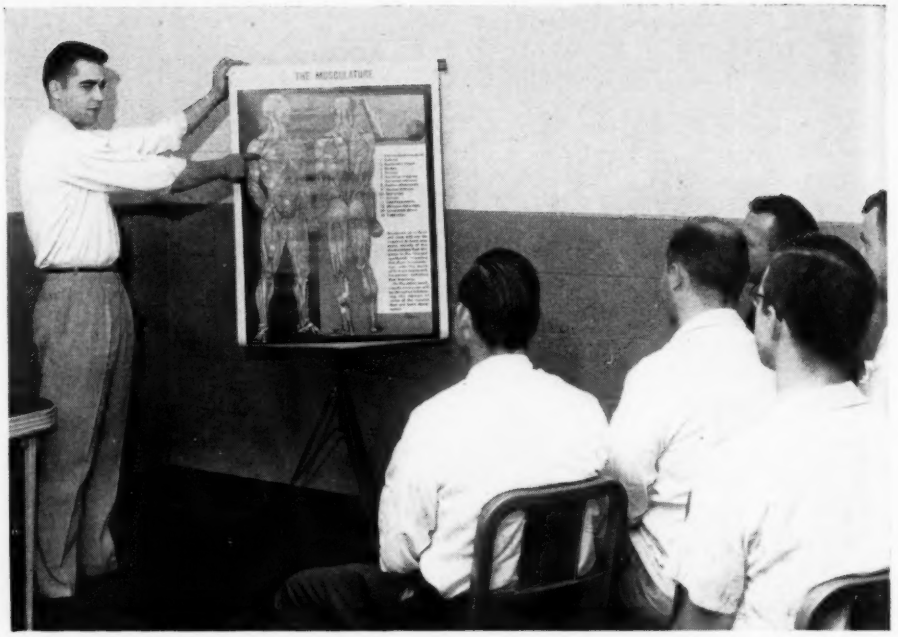


Table A gives a cross-index of the theoretical number of trunks per choice for various sizes of trunk groups.

To summarize, the above technique should result in a more efficient utilization of trunks in a given group under the circumstances outlined above. However, it should be pointed out that the addition of equipment such as rotary outgoing trunk switches would be advisable in the more expensive trunk groups to further increase the over-all trunk efficiency.



John Ladd, Adrian, Mich., switchboardman of the Union Telephone Co., was one of the instructors in the company-wide First Aid training program.

Independent's First Aid Program Company-Wide

Union Telephone Co., Owosso, Mich., has announced that 18-hour standard First Aid courses for 25 plant employes of its Adrian district have been completed. Monthly two-hour classes of the company-promoted first aid program were started in February. The program consisted of the Red Cross Standard First Aid course plus several educational films concerning first aid and safety.

The company reports that because the men realized the benefits of this training, a class average grade for the entire course, of 93 per cent, resulted.

This program is company-wide and represents an attempt to promote safety and the knowledge of proper first aid.

According to the company, much of the credit for the success of the program in Adrian district goes to John Ladd, switchboardman, who served as instructor.

Mr. Ladd attended a 30-hour training course in Owosso in January 1956 in preparation for his job. This course included first aid proper and also lessons in instructing first aid and was conducted by a Red Cross representative.

Learning from Others

"A wise and good man will turn examples of all sorts to his own advantage. The good he will make his patterns, and strive to equal or excel them. The bad he will by all means avoid."—THOMAS Á KEMPIS.

The Cameron district meeting, one of several held recently by the Missouri Telephone Association, attracted those shown for a program of speakers, films, and plant and traffic conferences.

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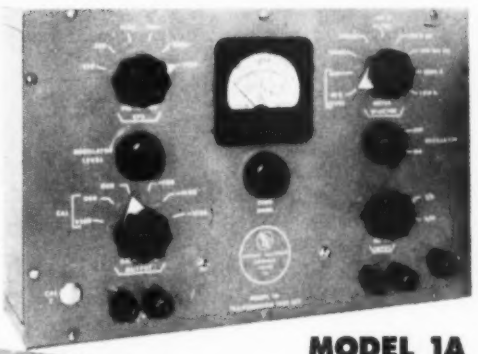
BOX 425 - CONCORD, NEW HAMPSHIRE

RESEARCH • DEVELOPMENT • DESIGN • MANUFACTURE

MODEL 1A TTS six level stabilized oscillator frequencies of 250 cps to 3 KC. Volt, ohm and current scales. Measures level from +15 dbm to —15 dbm. Switching for straightaway and loop insertion loss measurements.

MODEL 0 TTS level stabilized 1000 cps oscillator; level measuring from +2 dbm to —16 dbm. Switching for straightaway and loop insertion loss measurements.



MODEL 1A

MODEL 0

TRANSMISSION Measuring Equipment

Northeast Electronics Corporation is singularly qualified to design, develop and manufacture special electronic equipment for the telephone industry.

BLEEPER

BLEEPER easily identified pulsed tone to trace or check wiring.

MODEL 3

MODEL 3 TTS twenty four level stabilized oscillator frequencies from 75 cps to 12 KC. Meter amplifier provides readings from +20 dbm to —60 dbm, volt, ohm and current scales. Switching for straightaway and loop insertion loss measurements included.

For further information contact Northeast Electronics Corp. or your distributor.

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"Looks like they made it

e it to last forever!"

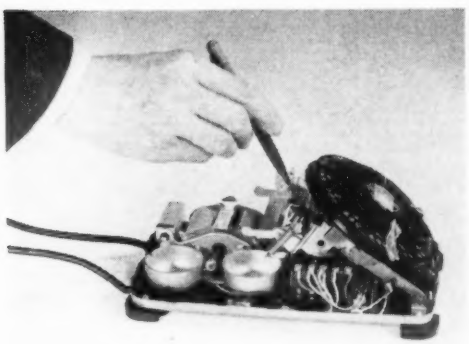
The first time you peek inside Automatic's Type 80 Monophone, you're *sold!* You're convinced that here's a telephone that's built to last.

Following are a few simple tests that will convince you even further:

1

Take off the housing—and don't be gentle with it! Flex it this way and that; it can take hard handling without cracking.

2



Check the twin contacts and dust covers on the sturdily-built hookswitch and the smooth-working dial. They'll keep servicing down!

3

Look at the balancing network unit. It's completely moisture-sealed—could be kept under water for years and still work without the slightest trouble.

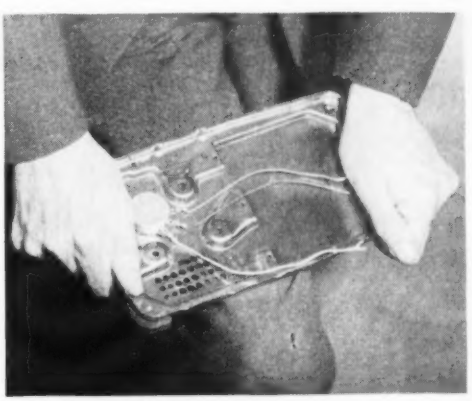
4

Twist the cord, yank it, scrape it—it'll stay in good shape. It's long-wearing, kink-resistant, moisture proof.

5

Examine the ringer, too. It's sensitive and dependable, built to ring true through long years of hard use—can be removed with only a screwdriver (like all Type 80 components).

6



Try to bend the baseplate. It's a strong, heavy piece of metal. It stays rigid, keeps every component perfectly aligned.

Every day more customers are trying tests like these—
and signing very nice orders as a result. Which they never regret.
For Type 80 Monophones keep their maintenance down,
and please their subscribers mightily. They will do the same for you.
Why not send your order in today? Address:
Automatic Electric Sales Corporation, 1033 W. Van Buren St.,
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GENERAL TELEPHONE SYSTEM

ORIGINATORS OF THE DIAL TELEPHONE

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TROUBLE CLEARING

A Convenient and Timesaving Chart

By L. N. MARTIN

IN OUR article which appeared on page 28 of the Mar. 31 issue of TELEPHONY, we discussed the method of computing the impedance and its angle when the resistance and reactance are known. We stated that this operation involves a knowledge of trigonometry which many good telephone men do not possess. However, we said: "*We have seen a very ingenious chart with which anyone without trigonometry can solve a right angle.*" The purpose of this article is to describe this chart so that anyone who is interested may have one made by a good draftsman.

Even if one can solve these problems by trigonometry it involves much laborious and tedious work. Looking up the functions in a table is a simple matter (after one learns the method), but it also involves multiplying and dividing these functions which are often five or six-digit numbers.

These multiplications and divisions may be performed by means of logarithms with somewhat less work, but also with somewhat less accuracy. As usually performed, either three-place or four-place accuracy is obtained. In fact, for most practical problems, three-place accuracy is sufficient.

Therefore, a chart which will solve this type of problem with sufficient accuracy in a minute or less is a practical tool for the engineer as well as for the student.

The chart which we are using measures 20 inches x 20 inches and with its margins is about 2 feet square, and is, therefore, spread out on a table or desk when in use. If the chart were reduced to a size that could be reproduced on a page of TELEPHONY, it would be too small and too congested to be of any practical use and would not even be suitable for descriptive purposes. We have, therefore, prepared *Chart 1* which may be called a skeleton chart and which shows the principal lines only.

Referring to *Chart 1*, it will be seen that it consists of four sets of lines:

(1) Eleven vertical lines numbered from 0 on the left to 10 on the right.

PART 52. The preceding article in this series appeared on page 24 of the Sept. 22 issue.

In the complete chart each of these 10 spaces is divided into 10 smaller spaces by finer lines, and each of these smaller spaces is divided into five parts by still finer lines. As used in electrical work, this is the Resistance or "R" scale.

The decimal point may be placed where required. Thus, the scale may be read: 0-10 (as shown), 0-100, 0-1000, 0-1, 0-.1, 0-.01, etc. Thus, on the complete chart any number whatsoever may be spotted with three-place accuracy. (On this sample chart we can spot one place exactly and a second digit can be estimated quite closely.)

(2) Eleven horizontal lines numbered from 0 at the bottom to 10 at the top. This is the Reactance or "V" scale. It is used in the same manner as the "R" scale. However, in any one problem both scales must be read the same way. Thus, if the "R" scale has been taken as 0-100 the "X" scale must also be read 0-100.

(3) A series of segments of circles spaced the same distance apart as the lines of the "R" and "X" scales and with their common center at the 0 in the lower left corner of the chart. These curved lines are numbered from 0 in the lower left corner to 14 near the upper right corner. This is the Impedance or "Z" scale and in any one

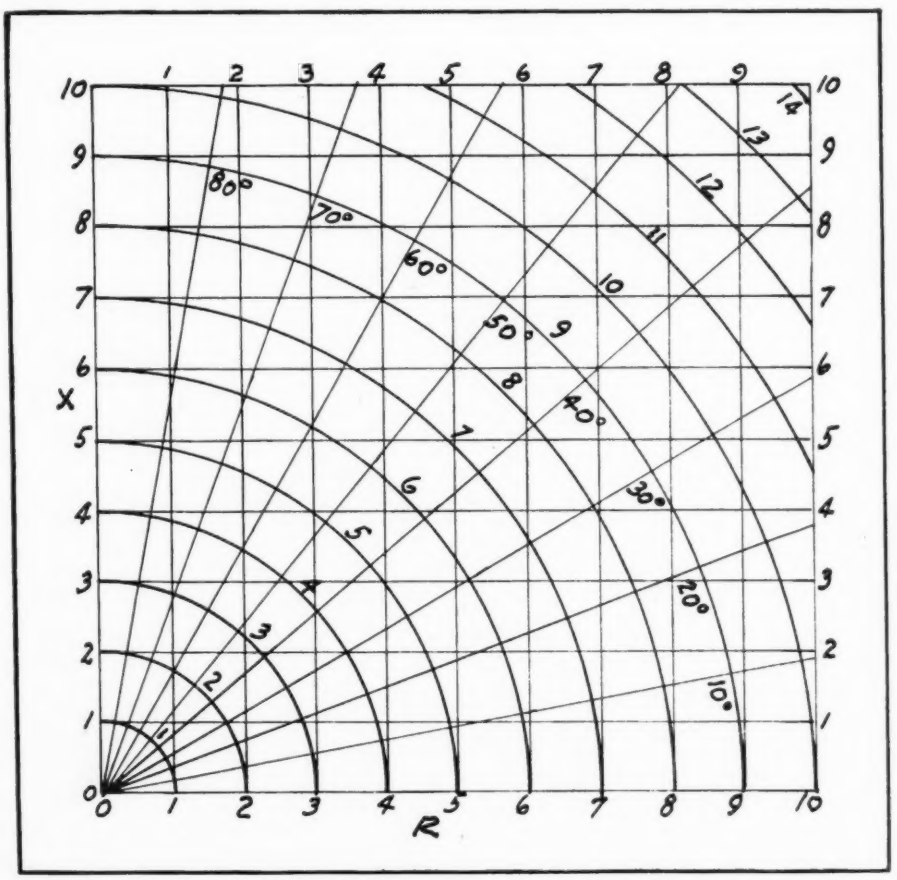
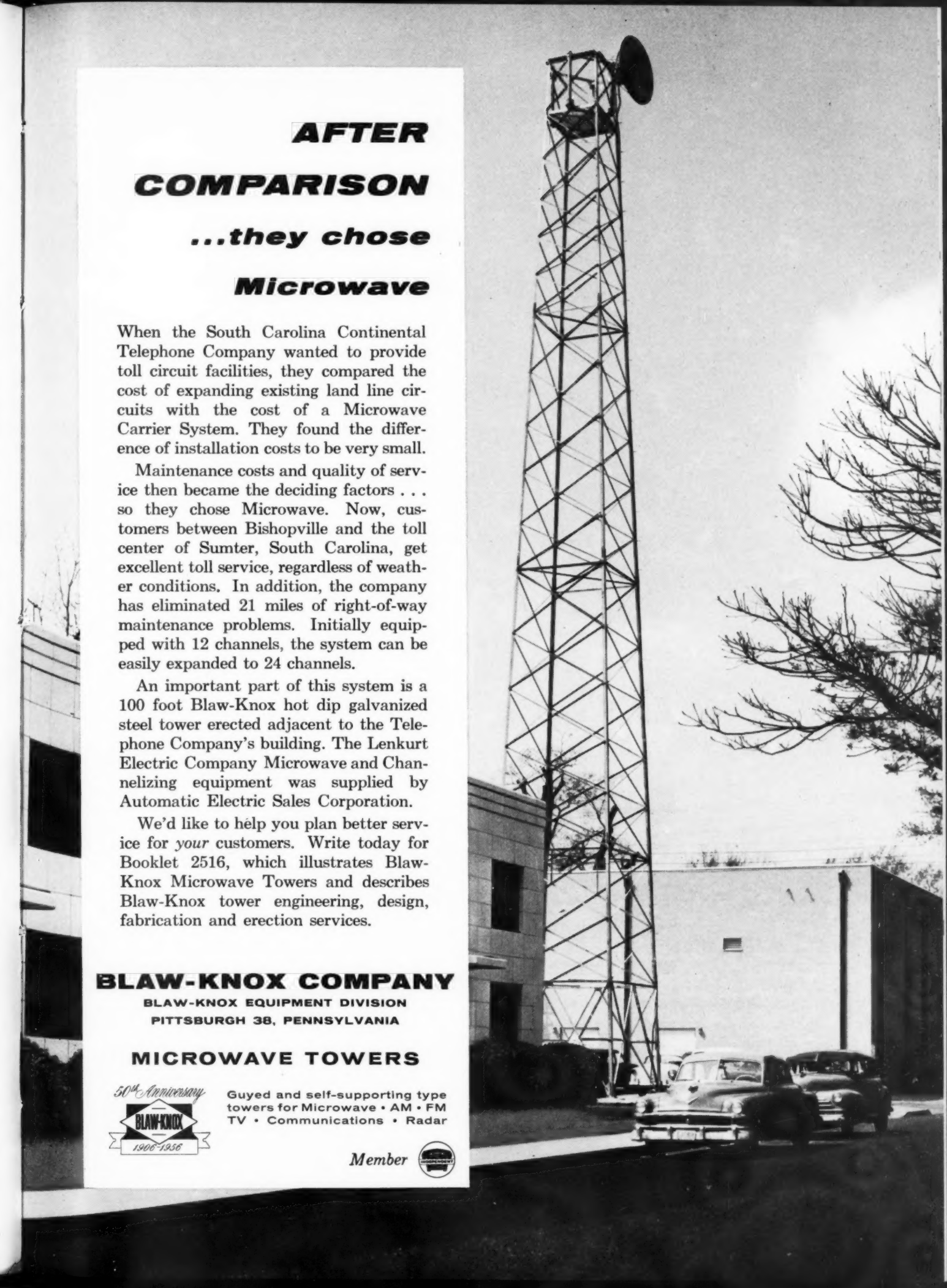


Chart 1



AFTER COMPARISON ...they chose Microwave

When the South Carolina Continental Telephone Company wanted to provide toll circuit facilities, they compared the cost of expanding existing land line circuits with the cost of a Microwave Carrier System. They found the difference of installation costs to be very small.

Maintenance costs and quality of service then became the deciding factors . . . so they chose Microwave. Now, customers between Bishopville and the toll center of Sumter, South Carolina, get excellent toll service, regardless of weather conditions. In addition, the company has eliminated 21 miles of right-of-way maintenance problems. Initially equipped with 12 channels, the system can be easily expanded to 24 channels.

An important part of this system is a 100 foot Blaw-Knox hot dip galvanized steel tower erected adjacent to the Telephone Company's building. The Lenkurt Electric Company Microwave and Channelizing equipment was supplied by Automatic Electric Sales Corporation.

We'd like to help you plan better service for *your* customers. Write today for Booklet 2516, which illustrates Blaw-Knox Microwave Towers and describes Blaw-Knox tower engineering, design, fabrication and erection services.

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50th Anniversary BLAW-KNOX 1906-1956

Guyed and self-supporting type towers for Microwave • AM • FM TV • Communications • Radar

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problem it must be read in the same way that the "R" and "X" scales have been read.

(4) Radii drawn at 10° intervals from 0° to 90°. On the full-sized chart these radii are drawn at 1° intervals with a heavier line at each 5° interval. This is the angle scale and, in our work, 1° accuracy is usually sufficient.

However, on the large chart the angle can be read correctly to about 15 minutes. Needless to say, this scale does not change its value as is the case with the other three scales. It is always read in degrees.

Now let us try a few problems:

(1) This will be a simple one. Given three ohms resistance and four ohms positive reactance, what is the impedance and its angle? In this case, we will read all scales as 0-10 and each space as 1.

From 3 at the bottom we trace the line up to its intersection with a line coming from 4 on the left. This crossing occurs at 5 on the "Z" scale. Therefore Z = 4 (Which, in this, is the exact answer).

Now, this intersection is between the 50° and the 60° lines and as near as we can estimate on this small chart the angle lies between 53° and 54° (If the reactance had been negative the *angle* would also have been negative but *the impedance is always positive*).

(2) Given R = 55 and X = 75. What is the impedance and its angle? In this case we must read all scales as 0-100 and each division as 10. Fifty-five (55) is found half way between 5 and 6 on the "R" scale and 75 half way between 7 and 8 on the "X" scale.

The intersection lies between 9 (90) and 10 (100) on the "Z" scale, and as nearly as we can estimate, Z = 93. The angles lies between 54° and 55°.

(3) Given R = 5 and X = 55. What is the impedance and the angle? In this case, we cannot use the 0-10 scale for R, as X must obviously be spotted on a 0-100 scale and the "R" scale must be read the same way.

We, therefore, spot R half way between 0 and 1 and X half way between 5 and 6. These lines intersect between 5 and 6 (50 and 60) on the "Z" scale and Z appears to be 55 (it is actually slightly higher).

In this case, the reactance and the impedance are nearly the same. This is because the resistance is very low, compared to the reactance.

If the resistance were zero the impedance would be equal to the reactance and the angle would be 90°. If the reactance were zero the impedance would be equal to the resistance and the angle would be zero. In this case, the angle appears to be about 86°.

(4) An impedance of 85 ohms has an angle of 55°. What are its resistance and reactance components? We follow the 55° line out to 85 on the "Z" scale. A line down from this intersection leads to 50 ohms on the "R" scale, and a line to the left leads to about 69 on the "X" scale. Therefore (as nearly as we can ascertain with this chart), R = 50 and X = 69.

(5) Given R = 325 and X = 275. Find Z and the angle. Here we must use 0-1000 scales, and our answer will not be very accurate. However, *the exact answer could be found on the full-sized chart*. Three hundred twenty-five (325) will be found one-fourth of the way between 3 and 4 on the "R" scale and 275 is found three-fourths of the way between 2 and 3 on the "X" scale. The intersection appears to be at 430 on the "Z" scale and the angle is about 40°.

It can readily be understood that the actual chart should be prepared as accurately as possible by a competent draftsman. The drawing should, of course, be made on tracing paper and blue-print copies made for actual use.

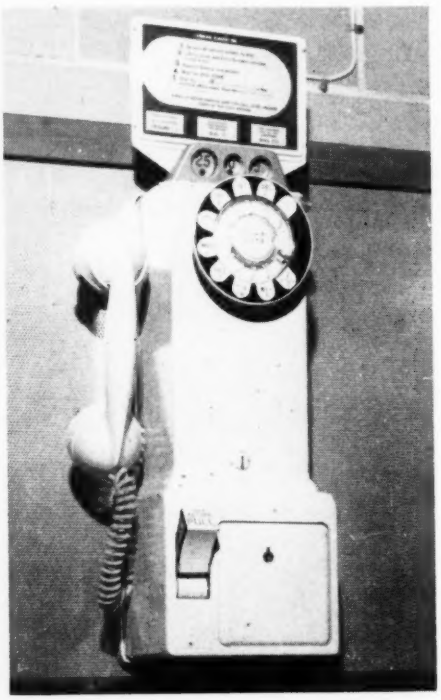
(Acknowledgment: The author obtained the idea for this chart from a chart which was prepared in the office of the chief engineer of the Illinois Bell Telephone Co. The chart here presented is a modification of that chart.)

Mountain States Experiments With Color Paystations

By ROBERT LATIMER

ENTRY into many smart, exclusive locations which have hitherto been closed to standard black pay telephones, is the goal of a novel experiment currently underway at Mountain States Telephone & Telegraph Co., with headquarters in Denver, Colo.

The program was developed by Al Stewart, general sales engineer, as the only logical solution to a common problem—that of paystation installations in locations where the standard black telephone would "stick out like the proverbial sore thumb." Included are cocktail lounges, smart apparel shops, the lobbies of ultra modern apartment houses and hotels.



Typical color pay telephone installed in the new May Co. department store in Denver.

In most such instances, as Mr. Stewart points out, considerable expense is involved in the decor of the location and the local management takes a dim view of marring it with the utilitarian black of the usual pay telephone.

Consequently, Mountain States sales office offers pay telephones in eight basic colors, akin to those which have been offered for handset telephones with outstanding success. The colors which are "possible rather than offered" include buff, ivory, gray, brown, red, green, blue and yellow.

Repressed versions of each color are being featured, with the red telephone and possibly the yellow as the only colors which fit into the "bright" classification.

There are many color installations in the city, each of them representing something of a triumph in that the color had made it possible to "crack" a difficult-to-obtain location. Typical is the new 1½-million-dollar University Hills store of The May Co., Denver department store, which has followed lines of extreme modernity in color throughout a suburban shopping center.

The experiment will be carried out over an indefinite period, according to Mr. Stewart, while a close check on the results is kept.

The major factor in determining the future of colored pay telephones will

(Please turn to page 52)

XUM

New HOMELITE Pump

Whispers While It Works

Goodby residential complaints! Here's a new lightweight gasoline engine driven pump that takes it easy on the neighbors' ears. Yet handles any water problem . . . from seepage to volumn pumping! The new Homelite Model 36 S2 2″ self priming centrifugal Pump operates at slow speed with low noise level yet has high capacity of 9000 gallons per hour. It weighs only 85 pounds and can be easily carried by one man to the best pumping location. Starts quickly, primes automatically, gives long, dependable and trouble-free service under the toughest conditions. Ask your Homelite Representative for a free demonstration. You'll find a good neighbor policy in every pump.

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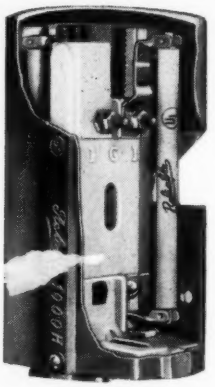
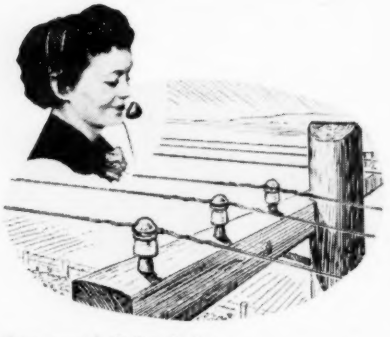
1812 RIVERDALE AVENUE • PORT CHESTER, N. Y.

Preformed Splices for damaged line wires and messengers or new construction. Easy to install, no tools required—simply wrap the splice around messenger or conductor. PREFORMED LINE PRODUCTS COMPANY.



Standardize on the "1000-H" Outdoor Protector with its self-cleaning Sawtooth Discharge Blocks. Made by RELIABLE ELECTRIC CO., with phosphor bronze clip; aluminum mounting bracket. Its low-absorption porcelain base prevents danger of shorting with fuse clips.



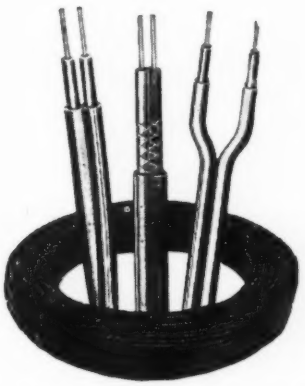
Copperweld Talks Better than any other high-strength conductor. Strong, non-rusting, easy to string, it's unequaled for long-life, long-span construction. Use .080"-30 E.H.S. for short subscriber loops and secondary toll lines—and .104"-40 H.S. for toll lines and long subscriber loops. COPPERWELD STEEL CO.

Outstanding Battery Performance is yours when you choose Gould Planté Batteries. Thick, grooved, pure lead positive plates give many years of trouble-free service! Made by GOULD-NATIONAL BATTERIES, INC., a leader in their field. They're the finest money can buy.

A GALLERY OF MASTERPIECES OF FINE LINE EQUIPMENT

XUM

The Time-Tested Steel Strand. A ductile, adherent zinc coating applied by the famous Crapo Galvanizing Process, provides lasting protection against corrosion in INDIANA STEEL & WIRE CO.'s Crapo Steel Strand. Minimum maintenance expense.



Long Service Life and Low Plant Costs go hand in hand with the installation of ENDURPRENE — The Neoprene Drop Wire available in both Copperweld and Bronze. This flexible and easy-to-handle wire is made by GENERAL INSULATED WIRE WORKS, INC.

Pull Trigger—Heats in Seconds to required temperature. TRIG-R-HEAT Electric Soldering Guns are equipped with 10-watt spotlight, separate switch and steel clad tips. Wattage range from 650 to 150. Operate on AC or DC current. Made by P. WALL MFG. COMPANY.

Kellogg's Standard Outside Plant Handbook now available at special price while quantities last. Reduced to $2.75 a copy with ten or more copies priced at $2.50 each. Every phase of outside plant telephone pole line construction is covered in book.

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be the durability of the telephones already installed, from an appearance standpoint. If each of the initial installations proves that the colorful paint job can stand up under heavy usage, there will undoubtedly be an expansion in their use.

North Carolina Company Celebrates 60th Year

The Lexington (N. C.) Telephone Co. recently celebrated its 60th anniversary and the event was recognized by the Lexington *Dispatch* in a two-column-head story of the company's history on page one, and by a full page of pictures showing various telephone company operations and equipment.

In addition, the company placed a one-page advertisement in the *Dispatch* to further spotlight its 60th year. William C. Harris is president and general manager.

The front-page story mentioned that the company is installing equipment which will tie into the nationwide inter-toll dialing system. The Lexington company serves 6,100 stations.

Code for Everyone

"No man is so insignificant as to be sure his example can do no hurt."—LORD CLARENDON.

The Power of Example

"Men trust rather to their eyes than to their ears; the effect of precepts is therefore slow and tedious, whilst that of examples is summary and effectual."—SENECA.

ABC OF THE TELEPHONE

Continued from page 22

binding wires are released prior to lowering the poles to the ground.

(5) Place a strong sling around each end of the load, as shown in *Fig. 2*.

Each sling should be about one quarter of the length of load in from each end.

Fasten a 75 or 100-foot length of ⅝ inch plow steel wire rope or other rope of equivalent size and strength *to the side of the car or trailer to be unloaded*. On a flat car, the rope can be fastened to the trucks or truss rod. On a trailer fasten the rope to a similar substantial brace or frame member.

Pass the rope over the top of the load to the opposite side.

Wrap the rope once or twice around an arch bar or truss rod, or a similar substantial fixture, on the flat bed of the car or trailer.

Next, carry the rope to the end of the unit and place about two turns around a substantial frame member. On a flat car, the two draw bars provide a convenient spot to place these last two turns.

The object is to secure the sling so that it can be payed off to lower the load to the ground. For this reason, the frame members around which the rope is wrapped should be large enough to allow the rope to slide easily as tension is eased off the free end.

(6) Place the skids to receive the load (See *Fig. 3*).

Ground skids should be in place. Place four short wooden skids at about a 45° angle against the flat bed of the unit to be unloaded. These skids will assist in rolling the poles along the ground skid when the load is lowered.

(7) Cut the center stakes on the side to be unloaded. Pull the two sling ropes taut and hold them securely. Cut the center stakes and any binding wires on the side to be unloaded. Leave the two end stakes and wires intact until last.

(8) Cut the two end stakes. Cutting these stakes will release the load. Therefore, the two sling ropes must be held taut and secure. Cut the two end stakes. The men doing the cutting, generally with an ax, should face the load and move clear the moment the stakes are cut.

(9) Lower the load to the ground, as illustrated in *Fig. 4*. After the stakes are cut the load will drop into the slings and can easily be eased to the skids. Play off the wire rope until the poles reach the skids.

(10) Complete the unloading. Loosen the ropes and roll the poles away on the skids to their storage location. After the poles are on the skids, the poles remaining on the car can be rolled off one by one.

By using the wire rope slings and the step-by-step procedures, as outlined, there is practically no chance that the poles will drop or come loose. Without the slings it is possible that the load would cascade or fall. Persons around a falling load could be seriously injured. Also there is a good chance that the poles might be damaged or broken. Even with such a simple operation as unloading a carload of poles, it pays to do the job properly and safely.

Speaking of the proper way of handling poles, there also is a right way to use a pike or cant hook. Here are the procedures recommended by the pole suppliers:

(1) When working with butt-treated or full-treated poles, pikes or cant hooks should be applied below the 3-foot ground line area. The ground line area varies with the length of a pole. However, the safest area to use a pike or cant hook is about 2 feet from the butt of the pole.

(2) Pikes or cant hooks should never be stuck in the tops of poles. Instead, they should be applied below the top on the side of the pole. If a pike or cant hook is stuck into the top, a pole may split. Also, holes may let rain and moisture get into the pole, thus increasing the possibility of decay.

Roofing Poles

The generally accepted method of

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Hot Springs, Ark.

roofing a pole is to make a one-way 15° angle cut across the very top of the pole, as shown in *Fig. 5A*. This provides a sloping surface to drain off moisture and also exposes only a minimum amount of pole end area. Another method is to make two 45° cuts to form a peak at the top of the pole (see *Fig. 5B*). This method is effective in draining off moisture, but it does expose a little more end area of the pole.

Gaining Poles

Some years ago, notches or gains were cut in poles wherever a crossarm was to be attached. However, the newer method of gaining a pole is to make a continuous cut about ½ inch in depth from the top of the pole to a point down the pole to the location of the lowest crossarm. This is called slab gaining, because a slab is cut from the pole to provide the gained area, as shown in *Fig. 6*.

The gained area is required to allow the crossarm to rest against a flat surface on the pole. This reduces the chance of the crossarm teetering back and forth whenever a wind sets the line in motion.

A slab gain is suggested instead of individual gain cuts because a minimum number of pockets are created on the side of the pole to trap moisture. Even with a treated pole this helps lengthen the service life of the pole.

As a general rule, it is most economical to have poles gained and roofed by the pole company before they are shipped to the telephone company. In this way the necessary cuts can be made before the pole is treated. When the wood preserving compound is applied all areas of the pole will receive the proper treatment.

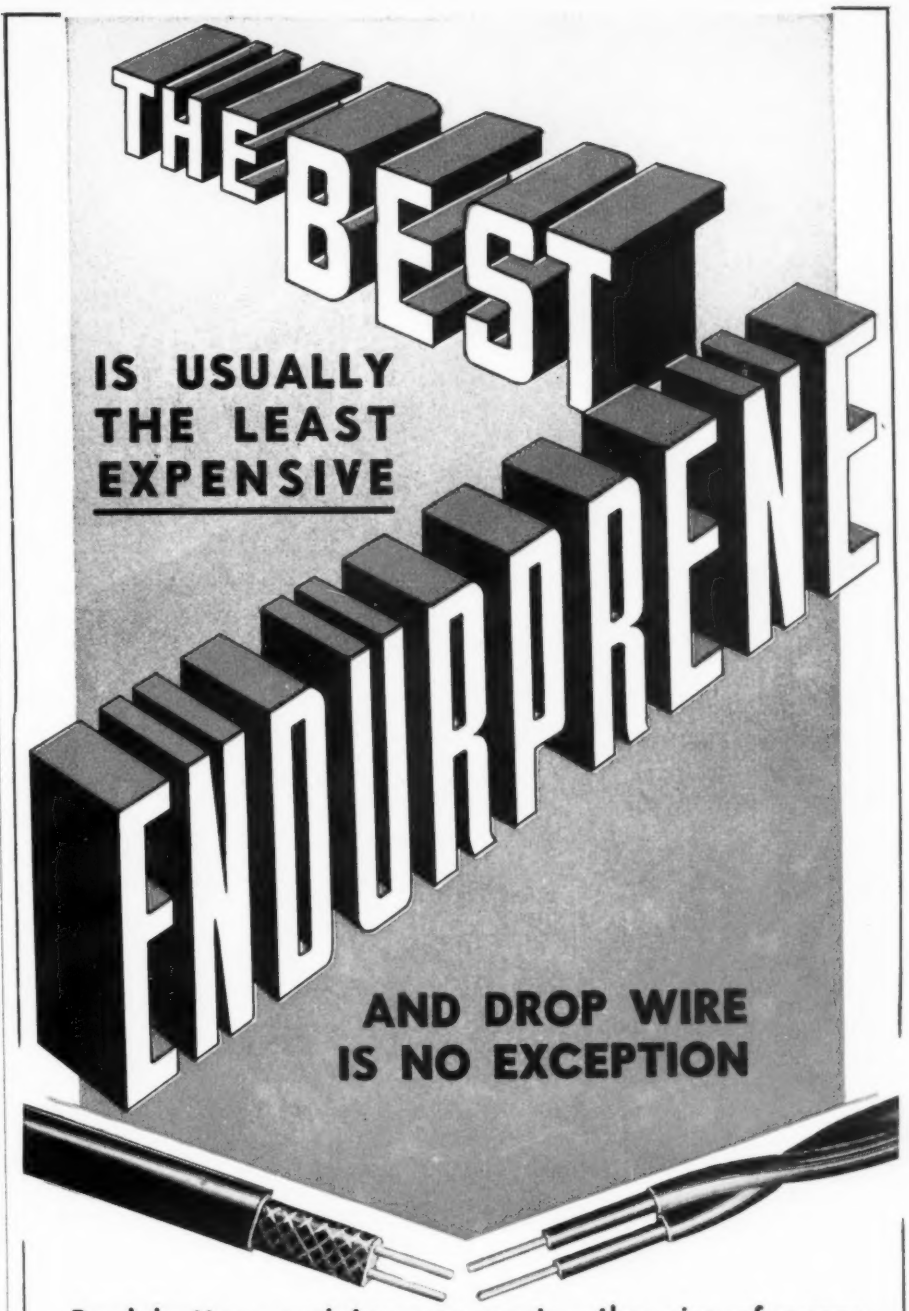
(To Be Continued)

What's Your Tax Bill For the Year?

Citizens Public Expenditure Survey suggests that "if you want to win a bet, bet your neighbor he can't tell you how much taxes he pays in a year." The odds are overwhelming that he can't—because of the vast number of hidden, indirect, and so-called 'painless' taxes that exist.

Here's the way the tax bill works out, according to a recent authoritative computation. If you make $67.30 a week, you pay $1,043 a year in taxes. If you make $86.54 a week, you pay $1,425 a year. And if you've got a job paying $7,500 a year, the tax collectors will get $2,637 of it—more than a third.

The *Survey* states: "At $86.54 a week, you work more hours to pay your taxes than for food and clothing combined."



Rock-bottom maintenance costs—the aim of every on-the-ball plant executive—come when you buy the drop wire that stays up, year after year, storm after storm.

NEOPRENE!

Ask your own Kellogg man for the whole story. He will be glad to furnish you an interesting box of samples.

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construction and maintenance DIGEST

- Insure your power
- Koiled kords
- How not to get cross
- Profitable noise
- Self-supporting

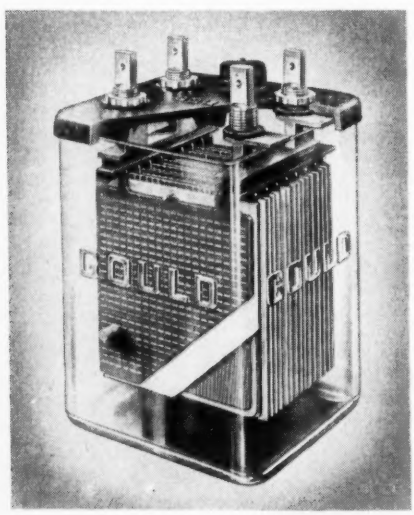
Published every week to help you get the most out of your materials and supplies dollar

by Gerald C. Gaydos, Inside Sales—Chicago

In my spare time I like to do crossword puzzles, but there's never any puzzle about the advantages of ordering supplies from Stromberg-Carlson. No matter where you're located, you're protected by a double guarantee on the fine products you order from Stromberg-Carlson . . . ours, and the maker's. This way, when emergencies make special demands—you're not alone. You find **two** solid companies right beside you, eager to help. That's how our 62-year reputation in the industry has grown. That's why it pays you to order from Stromberg-Carlson—leader in the research for new and better telephone equipment. We'd like you to know we appreciate your support.

Insure your power supply

Because Planté batteries practically last forever...providing standby power that never fails...they're the best operating insurance you can buy. In switchgear, signal and alarm systems, or emergency light and power applications, these lead batteries have rolled up amazing performance records . . . are famous for their ability to deliver a powerful surge or a steady flow of current the instant it's needed. Make sure you're in operation . . . always. Choose Gould Planté.



A sure, dependable supply of power when you need it. That, briefly, is the story of this Gould Planté battery.

Retractile cords now in black or color

There's extra revenue in Koiled Kords* retractile cords—the spring-like telephone cords that curl up neatly instead of dangling noose-like from the telephone.

Neoprene jacketed, they fit all types and makes of telephones, and last indefinitely under severe service conditions. Extend to about 5 times their retracted length and return to their original neat coil when released.

Tinsel conductors provide maximum flexibility.

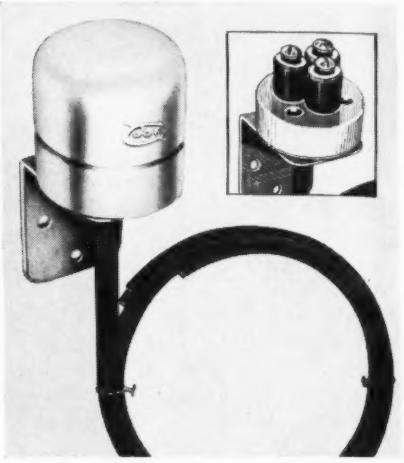
Available in black or color.

Neoprene outer jacket is smooth, clean, attractive, reduces cord trouble to a minimum.

*Koiled Kords is a trademark of Koiled Kords, Inc.

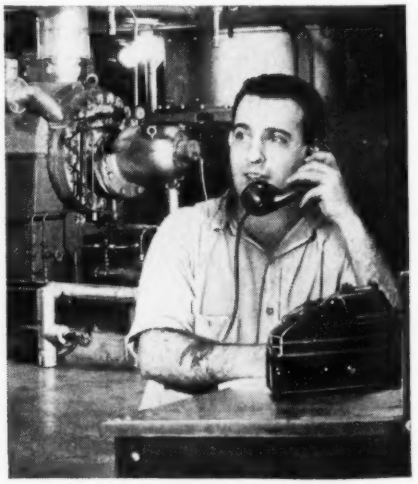
For dependable power cross protection

When buying protection for your telephone plant, specify nothing less than the best, and the best is the new Cook Hy-Cap Single-Circuit Power Cross Protector.



The best in power cross protection.

Protection is provided by 3 rugged carbon electrodes, two for connection to the telephone lines and the third for grounding. The electrodes are equally spaced and adjusted to discharge at 3000 volts. The specially compounded carbons will continue to discharge as long as the fault current exists, thus protecting your plant equipment and subscribers' property. Cook Catalog No. **501-40.**



Noise can be money!

Take a business subscriber who has a telephone in some extremely noisy location—and who has finally decided to do something about it.

Would you rather have him spend money in building a soundproofed booth—or give you the money as monthly income on a telephone which completely licks the noise problem?

The GAI-PHONE is such an instrument. It has a special transmitter that actually creates a "Zone of Quiet" around the handset—even in a spot as noisy as a boiler factory! It costs the subscriber less than a booth—and you get the revenue!

Ask us for complete details.

Distribution wire needs no cross arms

There are several reasons you can enjoy lower installing costs with this Whitney Blake multi-pair distribution wire.

Because it's self-supporting, it needs no cross arms. And it's easy to string because it's lightweight and comes in long lengths—up to 4000 feet per reel.

Self-supporting distribution wire has built-in messenger.

This wire has excellent electrical characteristics: low-loss transmission, low capacitance, high dielectric strength.

Its polyethylene insulation provides excellent weather resistance.

The wire is available with 6, 11 or 16 pairs of conductors. Each conductor is protected by a polyvinyl chloride covering.

Your Stromberg-Carlson representative will gladly introduce you to the economy of this wire. Call him.

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Courts and Commissions

Ohio Independent Asks To Reprice Local Rates

Col. Wm. C. Henry, president and general manager of Northern Ohio Telephone Co., has announced that his company filed an application with Ohio Public Utilities Commission on Nov. 21 seeking authority to reprice local exchange telephone service charges in order to provide a reasonable return on the value of its telephone property.

An appraisal of the present or depreciated value of the telephone property of this company as of Jan. 1, by the Gustav Hirsch Organization of Columbus, fixed the value of the company's telephone plant and equipment, including working capital and material and supplies, at $40,500,816. During the first nine months of 1956, further net additions in the amount of $1,975,914 have been added. Based on the value of its telephone plant as determined by the company's appraisal engineers, the net income of the company for the year 1955 was 3.73 per cent.

The net increase in telephone exchange charges requested amounts of $616,272 per annum, but to secure this amount, a gross increase of $1,323,493 is required. This is due to the fact that federal income taxes take 52 cents of each dollar and Ohio excise taxes take an additional three cents, leaving only 45 cents out of each dollar to add to net income, the company stated in its application.

Present telephone exchange service charges were effective Apr. 16, 1953, and were based on the value of the company's telephone property as of May 1, 1952. Net capital added for improvements and extensions to plant since May 1, 1952 and up to Sept. 30, 1956 have amounted to $7,979,350 or more than 44 per cent since May 1, 1952.

Increased revenues have failed to meet increased operating expenses and have provided far less than a reasonable return on the additional capital invested. Total wage costs alone have increased by $650,905 since the beginning of 1952, the company states.

The company estimates further net additions to telephone plant and equipment over the next three years in the amount of 6 million dollars. This will require the sale of additional issues of bonds or stock in order to obtain the capital required to extend and improve service. Securities must be sold in competition with the securities of other industries offered or available to investors. To maintain the financial integrity of the company and secure the additional capital required to provide service to the public, the company stated that exchange rates must be priced to provide a reasonable return on the value of its property.

W. Va. Independent Seeks Increase in Rates

A rate increase proposal by Webster Springs Telephone Co. was submitted to the West Virginia Public Service Commission for decision after a hearing on Oct. 29.

The company contends it lost $1,758 during the past fiscal year and has earned less than three per cent during the past five years. The higher rates would yield an additional $20,500. The company serves about 1,000 subscribers.

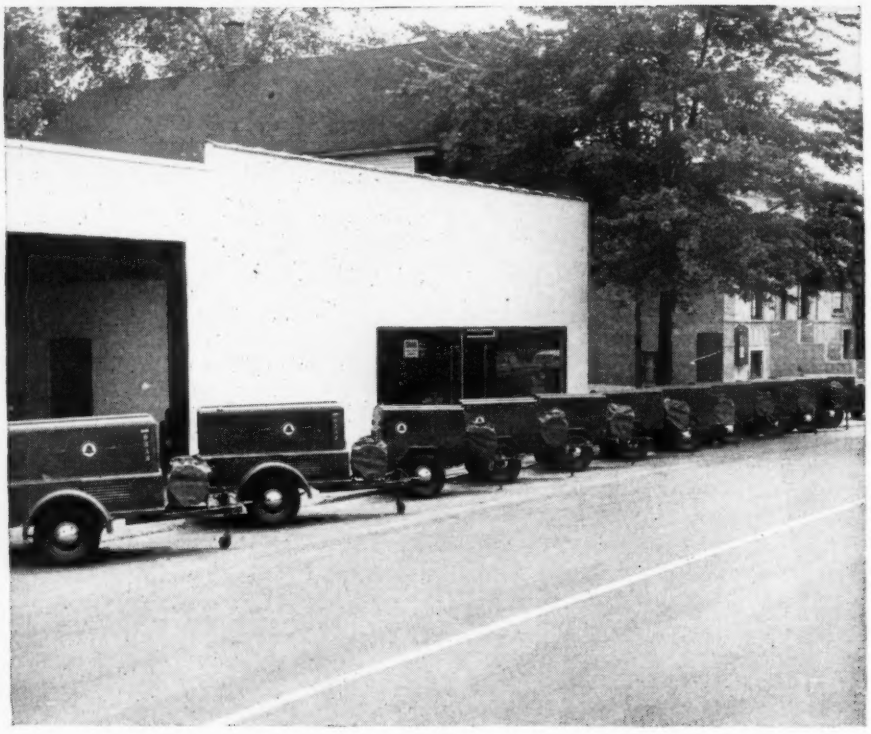
Ohio Commission Rules On Territory Boundaries

The Ohio Public Utilities Commission recently ruled upon an application wherein it was requested to determine the respective interests of two telephone companies in certain joint operating territory.

The commission stated it would appear that in the interest of proper regulation of telephone companies, boundaries should be fixed, whenever possible, to eliminate unnecessary duplication of facilities and to enable the companies involved, and the commission, to determine which company is responsible for telephone service in a particular area.

It is obvious, the commission said, that where the boundaries, or lack thereof, necessitate duplication of facilities, while it might serve the individual interests of some subscribers, it nevertheless creates a very uneconomical situation for the telephone companies. If cases of duplication of facilities were multiplied throughout the state, it would result in inefficiency and waste and cause higher telephone rates for the same quality of service, the commission pointed out.

"It seems, therefore, incumbent upon the commission, whenever possible, to eliminate duplicate facilities by the division of joint operating territories,



Power insurance . . . on wheels, for the Michigan Bell System

This fleet of eleven trailer-mounted Onan Electric Plants was recently put into service by the Michigan Bell Telephone Company. Self-contained and highly mobile, these gasoline-powered generating units can be rushed to any exchange where an outage of commercial power occurs.

The new fleet consists of six 5KW, three 10KW and two 25KW Onan plants. All are remote starting units generating 115/230-volt, 60-cycle, single-phase current. Each is mounted on a high-speed, 2-wheel trailer with a weatherproof housing that encloses the built-in fuel tank, starting battery, engine-instrument and electric meter panels, and A.C. outlet receptacles. The drawbar supports an extension cord reel.

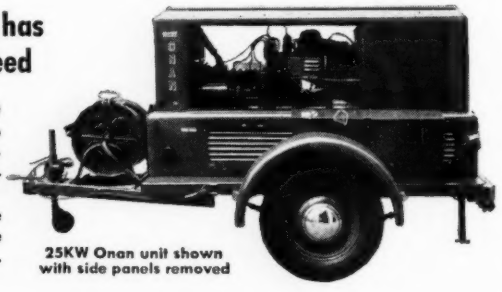
Within minutes after the electric plant arrives at the exchange, it is supplying power to keep telephone service operating.

The Michigan Bell System is one of many companies using Onan Emergency Electric Plants to help assure vital telephone communications at all times, under all conditions.

Trailer-mounted, or permanently installed, Onan has a standby plant for every need

Standby models are available from 1,000 to 75,000 watts. Air-cooled models up to 10,000 watts available with Vacu-Flo air-cooling for installation in areas where ventilation is a problem.

Onan also builds lightweight, portable plants for plug-in electricity on maintenance and construction jobs. 500 to 10,000 watts.



25KW Onan unit shown with side panels removed

See how other companies are using Onan Standby and Portable plants. WRITE FOR FOLDER.

Onan ELECTRIC PLANTS

D. W. ONAN & SONS INC.

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so that the proper part thereof, will be within the distribution area of each telephone company," the commission stated.

Central Telephone Requests Financing, Merger in N. C.

Central Telephone Co. on Nov. 19 asked the North Carolina Utilities Commission for authority to acquire the assets of the Hickory Telephone Co. and to issue stocks and bonds necessary to effect the merger.

Central company asked the commission to approve its plans to split its present common stock in order to issue one additional share for each 10 shares outstanding; to issue 90,000 shares of additional common stock to be exchanged for 60,000 shares of Hickory Telephone Co. stock; to issue 8,000 shares of cumulative preferred 5½ per cent stock with $100 stated value per share to be exchanged for 4,300 shares of its 5 per cent preferred stock and 3,500 shares of 5½ per cent preferred stock of the Hickory company; and to issue one million dollars of additional first mortgage collateral sinking fund bonds to be exchanged for first mortgage bonds of the Hickory company.

The company said in its petition to the commission that controlling stockholders of Hickory Telephone had agreed to exchange their stock for the Central Telephone stock, that meetings of stockholders of both companies have been called for Dec. 21 to vote on the proposed merger, and that "it is anticipated the merger will be effected Jan. 2, 1957."

Bell in Oregon Asks Added Revenue to Meet Wage Rise

Oregon's state public utilities commissioner on Nov. 14 was asked by the Pacific Telephone & Telegraph Co. to add to a pending request for rate increases further increased charges which would yield an additional $79,000 monthly (TELEPHONY, Sept. 22, p. 47).

The company said the supplemental request was a result of a final wage offer made to the Oregon Communication Workers of America and wage increases for other employes.

N. Y. Bell Asks to Reopen Plea Previously Denied

The New York Telephone Co. on Nov. 23 asked the New York Public Service Commission to reconsider and grant the rate increases for telephone service requested in 1953 and denied in 1954.

The commission's denial, the company pointed out, was overturned by the Court of Appeals earlier this year (TELEPHONY, Feb. 25, p. 36). The court

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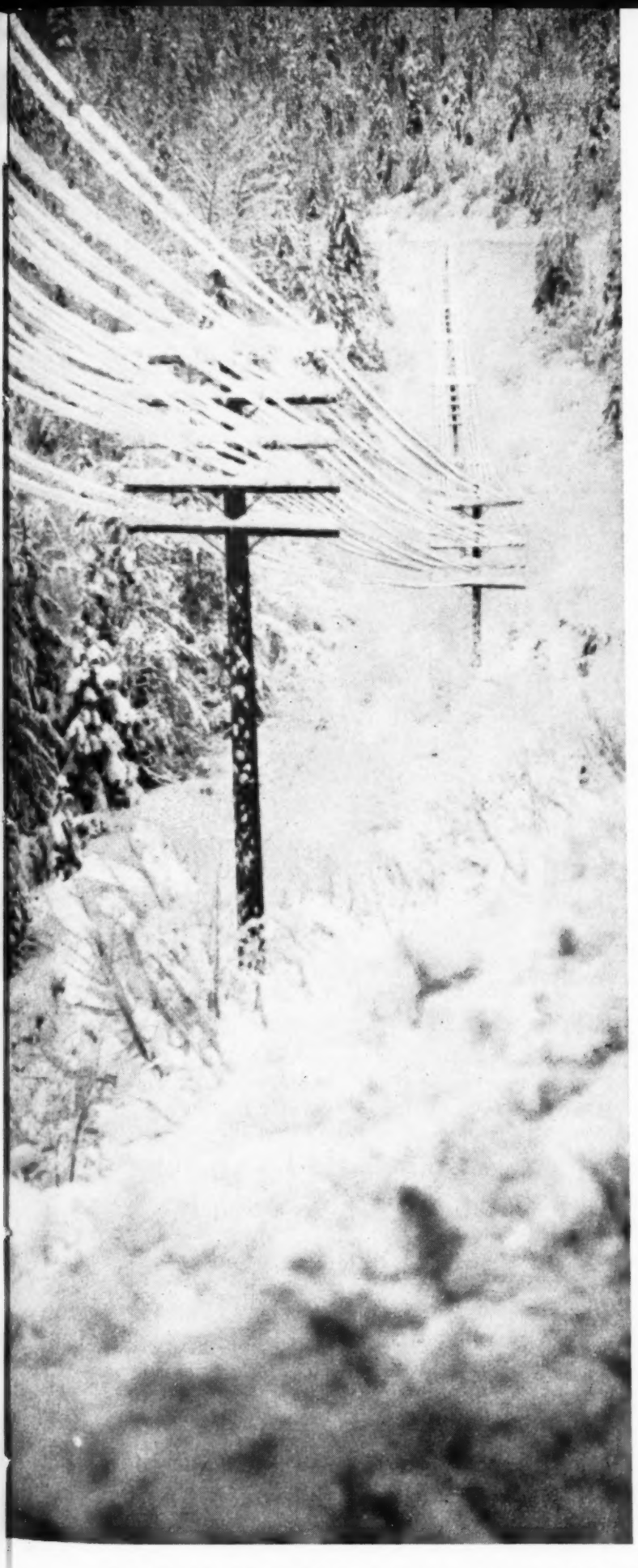

How polyethylene-covered cable

Withstands mountain weather

Here is an example of snow loading on telephone lines in a section of Washington where polyethylene-covered cable was first installed in 1950. The insulation has shown no deterioration despite temperatures 40 deg. below zero. In summer, sunlight and temperatures up to 115 deg. have had no discernible effect.

Field experience here has demonstrated that no special equipment is needed to string polyethylene-covered cable. It can be installed on existing poles without increasing crossarms or pole height. Extra tree trimming is unnecessary. Even where installations are near power lines and open wire, no outside interference has been apparent.

BAKELITE Brand Polyethylene and Vinyl Plastics are widely used to cover wire and cable in a variety of fields. Their dependability has been effectively demonstrated by use on signal control cable, utility line wire and service drop, power cable, and coaxial cable. These materials meet REA requirements for plastic-covered telephone wire. Also, IMSA specifications for fire alarm and signal control cable; ASA standards for weatherproof wire; and ASTM D1238-52T Type II, dielectric materials.

To keep informed on latest developments in the use of polyethylene and vinyl plastics for wire and cable covering, arrange to receive regular copies of Bakelite Company technical publications, available without cost. Write Dept. RM-180.

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For reliability both in product and in service . . . "Look to Lindsay" . . . specialists in telephone supplies *only*. —Phone or write for immediate delivery or required data.

THE LINDSAY TELEPHONE SUPPLY CO.
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Tel. Diamond 1-9212

remanded the case to the commission on the ground that the latter had illegally refused to receive evidence on the value of the company's property, as required by a law of 46 years' standing.

Keith S. McHugh, president of the company, said that the actual increases in rates would be less than originally requested in view of the "stop gap" awards made since 1953 — principally to meet increased wage costs. He added that the increases would average only about 6½ per cent of revenues. This would bring the company's total rate increases since before World War II to less than 28 per cent—an amount far below the rise of 95 per cent in the cost of living generally.

Two Former Workers Rejoin North Carolina Commission

Wesley H. Cleveland has resigned as general auditor of the Northeastern Telephone Corp. in London, Ky., to become auditor for the North Carolina Utilities Commission at Raleigh.

He was with the commission from Apr. 21, 1952, to July 1, 1953, when he resigned to become auditor and assistant manager of the Monroe (N. C.) Telephone Co. Later, he was with the Lexington (N. C.) Telephone Co. for 11 months as auditor and commercial manager.

Prior to joining the North Carolina Utilities Commission in 1952 he was with the Virginia Corporation Commission.

Another former worker who has just rejoined the North Carolina commission is Hardy D. Dudley, who has become director of the accounting department, succeeding V. L. Choate, who resigned last July to become an official of the Lee Telephone Co., Martinsville, Va., after having been with the commission since 1949. Mr. Dudley worked as Mr. Choate's assistant from Aug. 1, 1950, until he resigned April 1, 1952 to become assistant treasurer of the Public Service Co. of North Carolina, a natural gas distributing firm with headquarters at Gastonia. He was holding the latter post when he resigned to rejoin the commission.

General of Indiana Granted OK for Bond Exchange

General Telephone Co. of Indiana, Inc., was granted premission on Nov. 21, by the Indiana Public Service Commission to exchange the outstanding bonds of The Home Telephone & Telegraph Co. and Citizens Independent Telephone Co. for bonds of General Telephone Co. of Indiana, Inc., according to L. H. Meyer, of Lafayette, president of General of Indiana. The bonds

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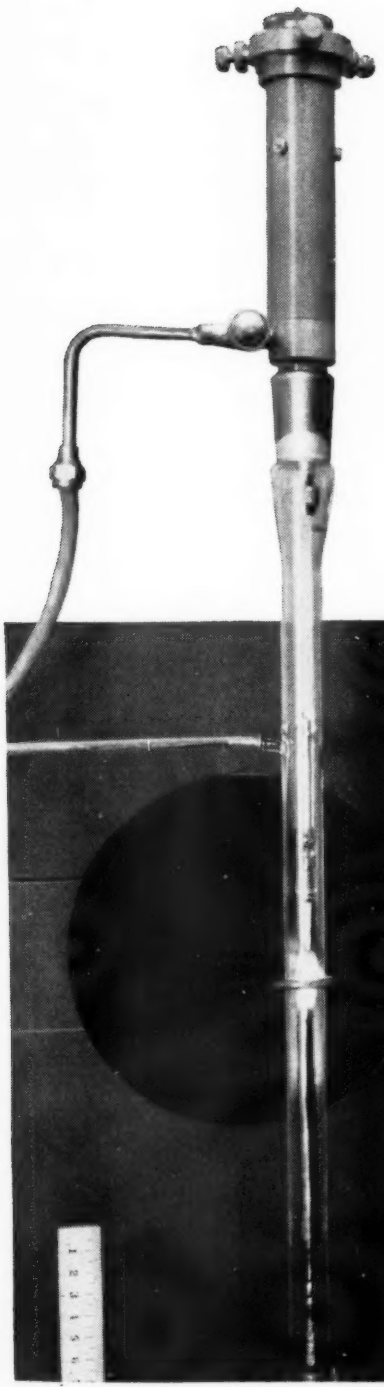
THE HOW AND WHY

OF THE WORLD'S PUREST SILICON



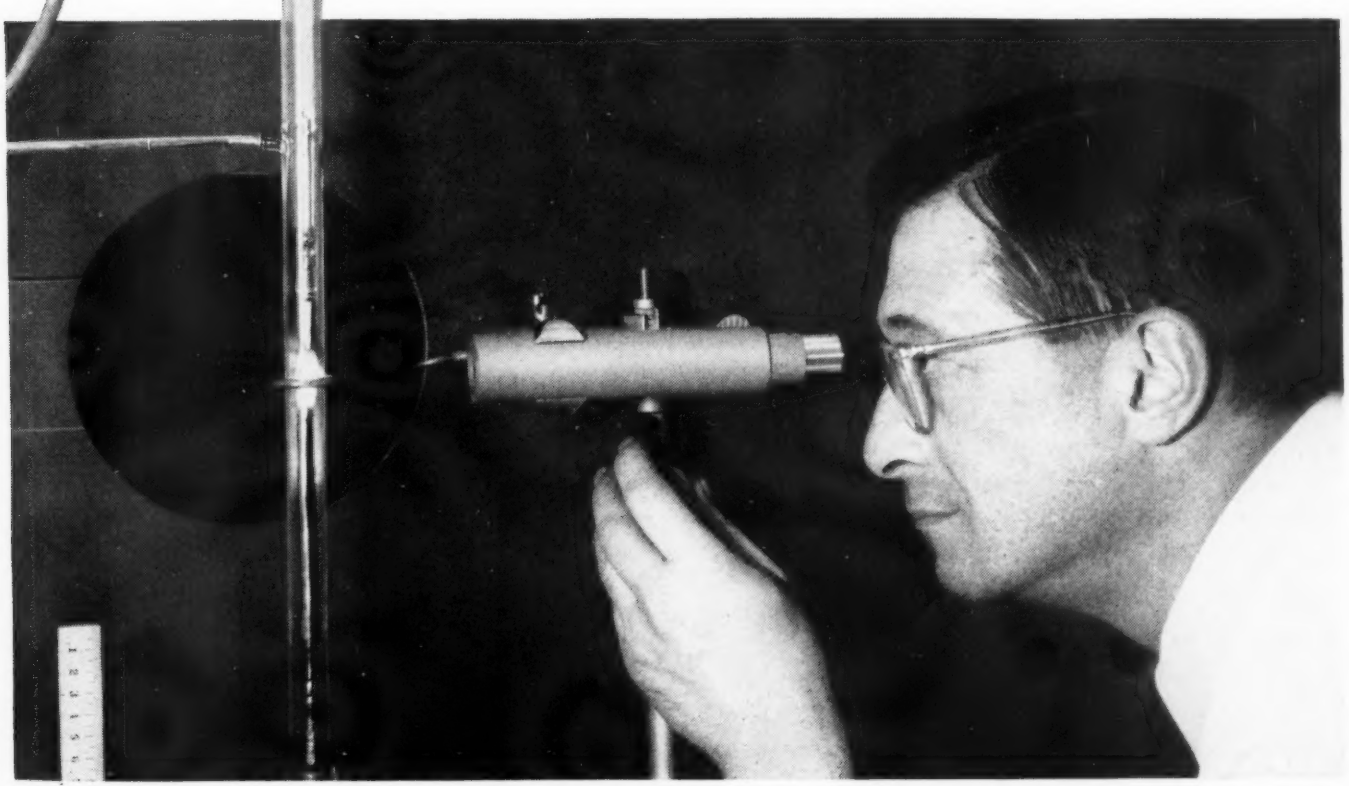
The purification of silicon by Bell Laboratories metallurgists has been richly rewarding. Their original research in this field revealed the chemical factors that control semiconductors; it was a major advance leading to Bell Laboratories' invention and development of transistors and the Bell Solar Battery. Now they have devised a simple but highly effective way to remove boron—one of the most difficult impurities to extract from silicon.

During refining, a stream of hydrogen and water vapor is kept flowing past the silicon. As the water vapor passes over the liquid silicon, it seizes boron atoms, forming boron oxide. The oxide is then pulled away to condense on the wall of the refining tube which is cooled by a water stream. Result of refining: boron and other harmful impurities are reduced to less than one part in 10,000,000,000.

The new silicon is being used to develop still better transistors and rectifiers for telephony. It is another example of how Bell Laboratories metallurgists help open the way to improved telephony.

BELL TELEPHONE LABORATORIES

World center of communications research and development



Metallurgist Henry C. Theuerer, M.A. in Chemistry, Columbia, watches a molten zone in a silicon rod under purification. Mr. Theuerer's most recent achievement was development of water-vapor treatment for removal of boron.

XUM

it's dated

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ALPHADUCT DUMBBELL TYPE
NEOPRENE JACKETED DROP WIRE

LASTS LONGER • COSTS LESS!

Every coil of ALPHADUCT drop wire is dated by means of a color coded thread which indicates the year it was manufactured. In this way, with no record keeping, no muss, fuss or bother, you can tell how long Alphaduct stays up without requiring service or replacement.

We know that our dumbbell type neoprene jacketed drop wire will last. It's tested thoroughly through every manufacturing stage. The tough neoprene jacket resists abrasion, moisture, sunlight, oil, water. The insulation sticks tightly to the conductor. The dumbbell or figure eight shape makes the wire easy to split, makes a neat installation.

You, too, may know all this for sure by trying Alphaduct drop wire. And . . . by dating the wire we make it easy for you to prove to yourself that this is the most sensible drop wire investment you've ever made.

IT'S DATED • FOR YOUR CONVENIENCE AND PROTECTION

ALPHADUCT WIRE AND CABLE COMPANY

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NATIONAL DISTRIBUTORS—LEIGH SALES CORPORATION—CHICAGO, ILL.
REGIONAL DISTRIBUTORS—THE LINDSAY TELEPHONE SUPPLY CO., CLEVELAND, OHIO
PANKEY SUPPLY COMPANY, CHARLOTTESVILLE, VA.

authorized to be exchanged totalled $6,702,000 (TELEPHONY, Sept. 22, p. 32).

The first mortgage bonds of the Home and Citizens companies were owned by four insurance companies and, by arrangement with the holders of the bonds, General of Indiana was able to effect an exchange of the bonds of the Home and Citizens companies for bonds of General of Indiana. Mr. Meyer said that the exchange would substantially simplify the financial structure of the merged companies, which merger is expected to be finally effective early in December.

In the same commission order, General of Indiana was authorized to sell an additional 2.7 million dollars of its 4⅝ per cent first mortgage bonds to private investors, and $900,000 of its common stock to its parent, General Telephone Corp.

Mr. Meyer said that the proceeds from the sale of the 2.7 million dollars of first mortgage bonds and the $900,000 of the company's common stock will be used to repay advances made by its parent corporation and to liquidate outstanding bank loans. In addition the proceeds from the sale of common stock and bonds are expected to provide funds to complete the company's 1956 construction program.

Southern Bell Asks Raised Rate Schedule in Kentucky

Southern Bell Telephone & Telegraph Co. on Nov. 19 asked the Kentucky Public Service Commission to approve rate increases designed to yield 4½ million dollars more in Kentucky.

The commission set the hearing for Dec. 18.

Southern Bell stated that, as of Sept. 30, its return was only 4.75 per cent for the preceding 12 months, in Kentucky.

The increase in rates, it was stated, would raise the return to 6.75 per cent, which was described as the "fair rate."

Southern Bell has applied for rate increases six times since 1946, but the petition asserts that the commission has continued to refuse the company rate increases "commensurate with its needs."

The last rate increase was as of Sept. 1, 1954.

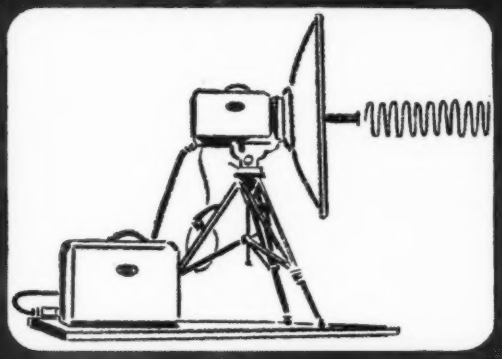
Missouri Company Granted OK on 6,000-Share Issue

The Missouri Public Service Commission issued an order on Nov. 9 authorizing the Capital City Telephone Co., Jefferson City, to increase its stock.

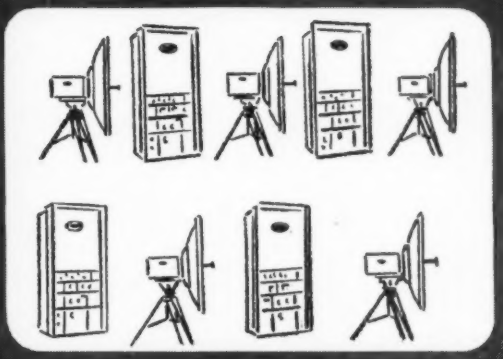
An additional 6,000 shares of common stock will be issued at a par value

XUM

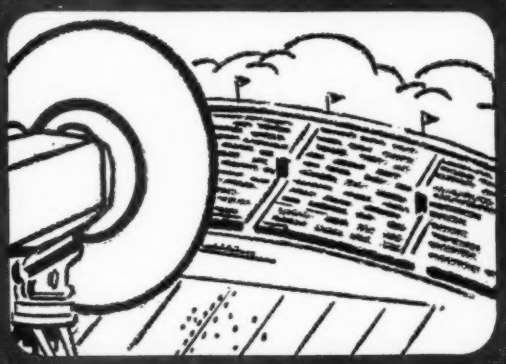
Best-Selling 20-Second Spot



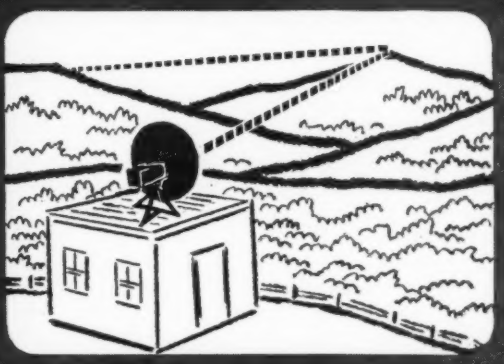
1. This is the famous Raytheon KTR-1000A microwave relay—just one in the biggest line of TV microwave relays in the industry.



2. Available in rack mounted or portable, 100 milliwatts or one watt at 6000 and 7000 mc; and 100 milliwatts in portable at 13,000 mc.



3. Four light, compact, portable units, total weight only 162 lbs., ideal for remotes. Provide simultaneous transmission of high fidelity audio with full NTSC color or monochrome video.



4. As STL's too, Raytheon links provide reliable, low-cost operation, with either portable or rack mounted equipment.

5. These and many other advantages add up to one big FACT—**Raytheon KTR links outsell all competitive makes.**

RAYTHEON

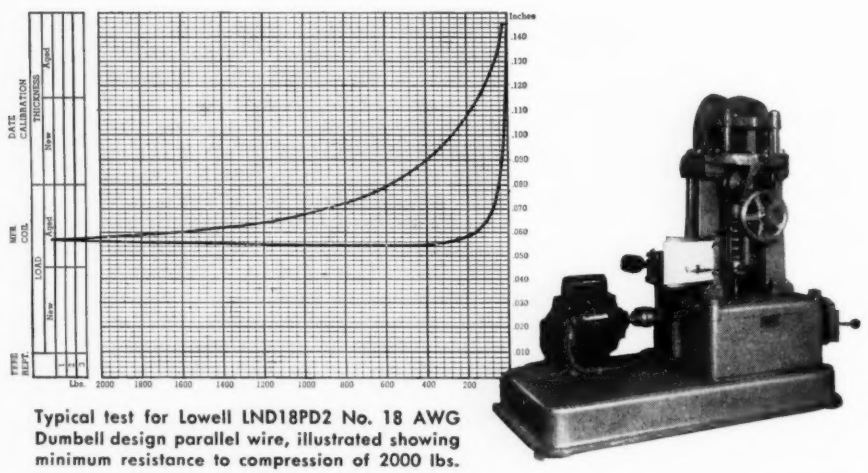
Excellence in Electronics

6. For full details, please write Raytheon Manufacturing Company, Equipment Marketing Department, Waltham 54, Mass., Dept. 6120.

No. 1 in a series of test results on LOWELL TELEPHONE WIRES: Resistance to Compression

LOWELL TELEPHONE WIRES ARE COMPRESSION TESTED TO INSURE LONG LIFE IN SERVICE

In determining the ability of a drop wire to stand up in service, resistance to compression is a major factor. All Lowell parallel neoprene jacketed drop wire is tested in our laboratory to withstand pressure of 2000 lbs. or more before the insulation jackets are crushed. To insure this high resistance to compression, all conductors are brass flashed and special insulating and jacketing compounds are used. Since resistance to compression determines the quality of the adhesion these tests prove that Lowell Drop Wire will stand the crushing action of the P Clamp without cracking of the insulation or jacket, thus insuring dependability and long life in service.



Typical test for Lowell LND18PD2 No. 18 AWG Dumbell design parallel wire, illustrated showing minimum resistance to compression of 2000 lbs.

COMPRESSION TESTER — tests and records resistance to compression of plastic or rubber insulation jackets.

Write today for Lowell Insulated Wire Catalog or mention your wiring needs.

"Fine Wires Only"

LOWELL INSULATED WIRE COMPANY

171 LINCOLN STREET ··· LOWELL, MASSACHUSETTS

of $50 a share. Company officials said that the additional funds will be used to accomplish extensive improvements made necessary by rapid expansion in recent years.

Approve Minnesota Sale, Dial Service Rates

Sale of the Garvin Community Telephone Co. to the Woodstock Telephone Co. and a schedule of increased rates for dial service at the Garvin exchange, were approved on Nov. 19 by the Minnesota Railroad & Warehouse Commission.

The Garvin company will continue to operate its manual exchange (serving approximately 95 stations) until the Woodstock company installs automatic equipment to serve the area. REA funds are to be used in the conversion of the Garvin exchange and in the furnishing of extended area service between Garvin and the Tracy exchange of Northwestern Bell Telephone Co. The planned automatic exchange will serve 147 stations, a survey by the Woodstock company shows.

Dial service rates will increase revenues at the Garvin exchange from $10,450 to $20,950 and net operating income from $1,463 to $4,699. Total fair value (plant in service, material and supplies, and working capital), presently $65,945, will be $124,645, the new rates affording a net return of 3.73 per cent.

Following are the approved net dial service rates:

One-party business	$7.00
Two-party business	6.00
Rural multi-party business	6.00
One-party residence	5.00
Four-party residence	4.25
Rural multi-party residence	5.00
Mileage Charge for service beyond the local base rate area, each ⅛ mile or fraction thereof:	
One-party	.30
Two-party, each subscriber	.20
Four-party, each subscriber	.15

N. C. Company Asks to Issue 200,000 Shares Common

Norfolk & Carolina Telephone Co., Elizabeth City, asked the North Carolina Utilities Commission on Nov. 21 for authority to issue 2,000 additional shares of its $100 par value common stock, at not less than par.

The company in its application said that proceeds from the stock sale will be used to carry through its construction program, including installation of an automatic switchboard at Cape Hatteras.

Wisdom's Restraint

"Modest doubt is called the beacon of the wise."—SHAKESPEARE.

XUM

KEY TO PROGRESS

Continued from page 24

These pressures for the preservation of a particular moral code are great indeed, particularly in the area that has been called "obedience to the unenforceable"—the things we do, not because they are required, but because they are right. This strength is much more potent and compelling than the law. The law is essentially negative and prohibitive.

Ethical principles are vibrantly and affirmatively alive. The segment of humanity concerned with business will be no less responsive to these pressures than any other group.

Be Wary of Submerging Individuals

This averaging process can have its bad side, of course, as well as its good. If the organization of modern society can hold a scoundrel in check, we run the risk, at the same time, that it can stifle the creative individual by submerging him into the common denominator. Society, indeed, sometimes seems intent upon inclining us in that direction. We see the constellation rather than the star; we applaud the ensemble rather than the brilliant soloist.

The trend can be seen, as I have indicated, in the inevitable and quite essential growth of our organizations. Science and production and administration have become necessarily dependent upon team effort. Our trade and labor unions almost by definition are dedicated to the sublimation of the individual to the general level.

Our taxing methods have the present effect of leveling the rewards of individual performance and, for the future, the often frightening prospect of curbing the will toward individual accomplishment.

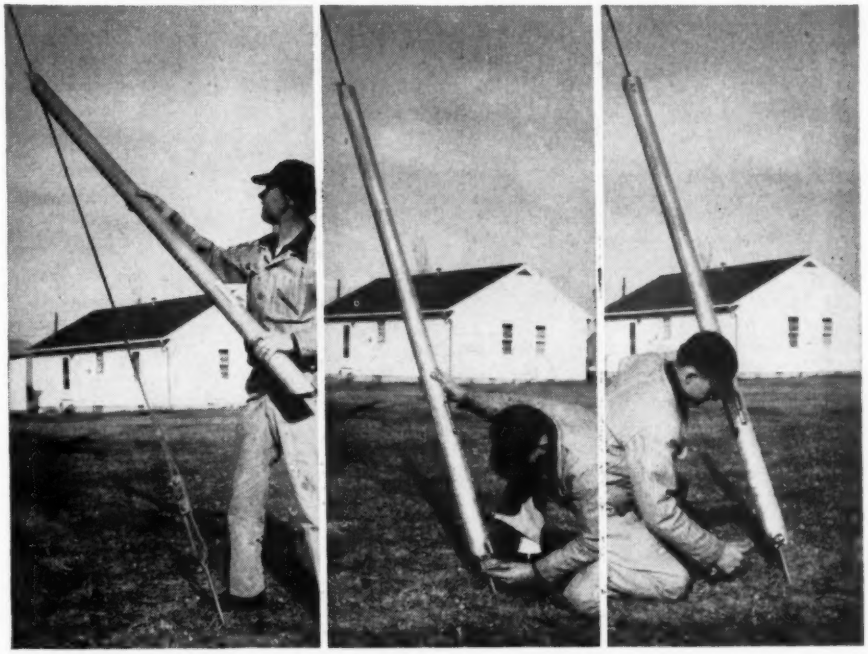
Even the folklore admonishes us with pious phrases to put our trust in mass rather than man, as in the tired, old doctrine that no man is indispensable. It seems to me that this country and the world have been enriched and invigorated most conspicuously by indispensable men, for the right man with the right idea at the right vortex of history has always been the indispensable man. Think of Newton, Lavoisier, Franklin, Archimedes, Gutenberg, and a host of others. Certainly the world could ill afford to dispense with their discoveries.

Must Consider the Future

Despite these trends, we seem thus far to have gotten by; it is the future about which we must think. Future developments may be expected in the

Tighten only 1 easy-to-reach bolt to install the CHANCE MONO-BOLT GUY GUARD

When a groundman installs a Chance Mono-Bolt Guy Guard, he has only three things to do:



1 Slip the flanged hook over the guy wire.

2 Place clamp on anchor rod and slide it into the slot at bottom of guard.

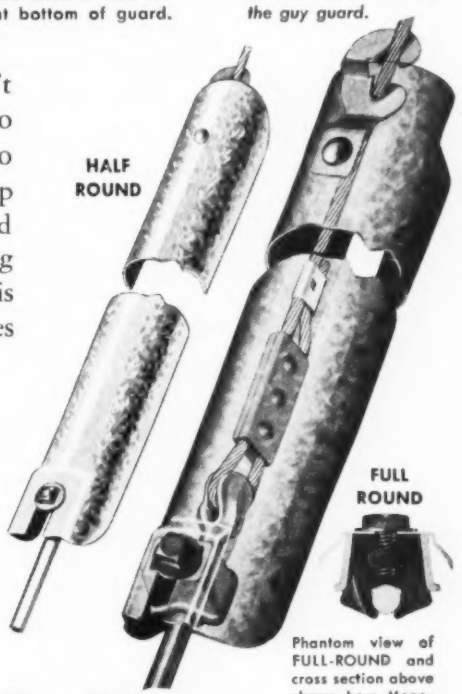
3 Tighten this one bolt at the lower end of the guy guard.

It's that easy—your men don't have to be extra tall—there's no stretching for high bolts to tighten . . . the Mono-Bolt clamp securely grips the anchor rod with a firm 3-point gripping action . . . only a single wrench is needed. Easy installation makes for proper installation.

Heavy gauge steel guard is hot galvanized for long life and high visibility.

Mono-Bolt Guy Guard comes in half or full round construction, in 7 and 8 foot lengths. Fits any size rod from ½" to 1¼".

CG56-9



Phantom view of FULL-ROUND and cross section above shows how Mono-Bolt Clamp grips anchor rod and guy guard

A·B·CHANCE CO·

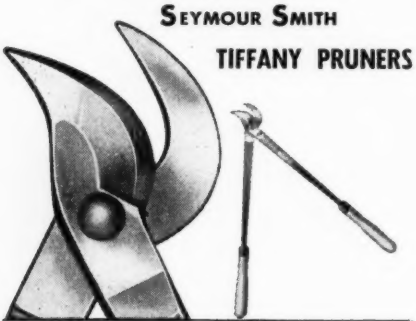
CENTRALIA, MISSOURI • San Francisco, Cal. • Pittsburgh, Penn.

Illustrated above is No. 11 Tree Pruner with center cut action by tempered steel blade that easily handles 1" branches. Head is reinforced malleable iron. Spruce poles with telescoping aluminum joints. For heavier work No. 12-18, capacity 1½". Also Pole Saws.

for clearing brush...

SEYMOUR SMITH

TIFFANY PRUNERS



Hand forged throughout. Fast and easy double cut action with thin blades shaped to "draw in." Improved bolt and nut joint, through handle and riveted grip fastening.

FAST-CUTTING SAWS

Blades of Swedish charcoal steel. Large, deep teeth with heavy set to prevent binding. Hand and Pole models for all work up to chain sawing.

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Since 1850

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next generation that will, in my opinion, prove at least as startling as those of the past 50 years. I am afraid I shall have to disappoint the pie-in-the-sky department by noting that I have nothing to offer as to the exact nature of these developments.

If you would take note of the form book on past prophets—even the intelligent ones—you will find that they have always missed out by falling far short of the actuality. The reason is a simple one. The future invariably takes its specific form from new principles that cannot be visualized by the forecaster.

In 1800, no one could have guessed at the revolution in transportation and its effect on human affairs. In 1850, no one could have foreseen the universal use of electricity and the uplift it gave to the public weal. In 1900, flight was something restricted to angels and birds. In 1925, the atom was only an unlocked Pandora's box.

In every age, there have been new principles just around the corner and that corner is still ahead of us today. The future is bright—of that we may be sure. What difference to us does it make now what the precise source of its brilliance may be?

Just when we will realize this promise of the future and how far the new developments will take us depends on how well we are able to recognize and encourage individual achievement. We cannot move very rapidly if we shut the door on our ablest people by absorbing them in the lifeless tomb of mediocrity.

The Uncommon Man

If I were faced with a choice between a society that sublimated the good with the bad, I think I would rather take my chances with the scoundrels than risk losing the creative force represented by the gifted individual, or what we might call the uncommon man. I am sure the country's long-term balance would sustain me here.

To play Mark Antony in reverse, it seems to me that the evil that men can do survives them only a short time, whereas the good, far from being interred with their bones, goes on and on forever. And the good that all men accomplish can be no more than the sum of their individual accomplishments.

Try as we will, we can create no synthetic genius, no composite leader. Men are not interchangeable parts like so many pinion gears or carburetors; genius, as John Adams said, is bestowed "imperiously" by nature upon an individual. And behind every advance of the human race is a germ of creation growing in the mind of some lone individual, an individual whose dreams waken him in the night while others lie contentedly asleep.

We need those dreams, for today's dreams represent tomorrow's realities. Yet, in the very nature of our mass effort, there lies this grave danger—not that the individual may circumvent the public will, but that he will himself be conformed and shaped to the general pattern, with the loss of his unique, original contributions.

The group nature of business enterprise itself will provide adequate safeguards against public affront.

The great problem, the great question, is to develop within the framework of the group the creative genius of the individual.

It is a problem for management, for public education, for government, for the church, for the press—for everyone. The stake is both the material one of preserving our most productive source of progress and the spiritual one of insuring to each individual the human dignity which is his birthright.

I know of no problem so pressing, of no issue so vital. For unless we can guarantee the encouragement and fruitfulness of the uncommon man, the future will lose for all men its virtue, its brightness, and its promise.

Cal. Interstate's Catenary Suspension Checked Over

The front cover photo shows Bob Overton and Al Modispacher, construction linemen of the California Interstate Telephone Co., San Bernardino, Cal., making an annual inspection of the catenary suspension which crosses over a portion of Crowley Lake.

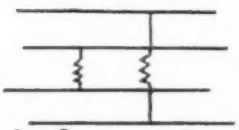
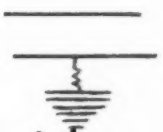
The catenary, constructed during 1948, supports toll circuits to Crowley Lake, Leevining and Bridgeport. It has a total length of 750 feet with a vertical ground clearance of 350 feet. Three 50-foot poles with seventeen 7-foot anchors were installed on each side of the canyon to support the structure.

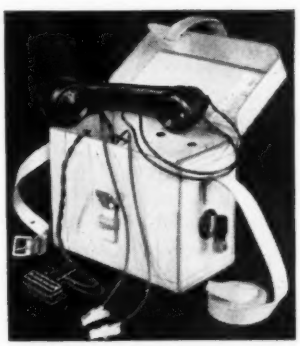
The structure was constructed to withstand a breaking strength of 150,000 pounds, and it was estimated during the winter of 1952 that the sleet load built up to about 20,000 pounds.

Messrs. Overton and Modispacher reported the catenary to be in good condition after completion of the inspection.

Room for Free Thought

"Error of opinion may be tolerated where reason is left free to combat it."
—THOMAS JEFFERSON.

Once upon a time there was a little telephone line. He was very high strung and lived far out in the country. During a storm he became very ill: he developed a short, a cross,  and a ground.  Even his feathered friends avoided him. When the storm was over, a man appeared carrying a small leather case, and in no time at all the little telephone line was well again, happily carrying calls. He's still puzzled, though, how the man found his troubles so quickly. You see, he doesn't know about West Test Set.



Moral: To find line troubles fast - use WEST TEST SET

With a West Test Set, one man can clear up miles of line trouble in just one day. More and more companies are using West Test Set for trouble shooting on all types of circuits, and as portable telephones. Write today for full details. *Address: Automatic Electric Sales Corporation, 1033 W. Van Buren St., Chicago 7. Or call HAymarket 1-4300.*

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ORIGINATORS OF THE DIAL TELEPHONE

"Since 1857"

It's a pleasure to use good tools —pliers that grip tight . . . that cut through tough wire easily . . . that reach confined spaces.

Linemen and electricians know that they can rely on their Kleins—side cutters, long nose, oblique cutters—famous for quality for a century.

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Write for your FREE copy of the Klein Pocket Tool Guide listing Klein equipment and giving valuable information.

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7200 McCORMICK ROAD • CHICAGO 45, ILLINOIS

IN THE NATION'S CAPITAL

Continued from page 18

Eugene A. Yates, chairman of the board of The Southern Co., in his reply to the SEC letter of inquiry about debt ratio, strongly emphasized the importance of maintaining an individual or flexible basis for particular company organizations, as opposed to trying to set any industry-wide range or formula.

Telephone companies, both Bell and Independent, have indicated in various rate cases that they regard the relative risk of their operations as warranting lower debt ratios. The positions of the Bell System companies average out at around 67 per cent of equity to 33 per cent debt. Bell companies feel that this comparatively low debt margin is necessary as a safety factor because the telephone business is more cyclical than either the electric or gas utility businesses. Telephone companies have relatively higher payroll and other operating expense requirement (in comparison with plant investment).

General Telephone Co. system companies are also conservatively financed at a very slightly higher debt ratio of around 35 per cent. Other Independents may show a little higher debt preference here and there. But on the whole, the telephone industry seems very anxious to keep its debt burden well below the 50-50 breaking point which the electric companies feel they can afford to carry on. Comparing this with the 60 per cent or more debt and fixed charge burden assumed by some of the natural gas pipelines, we see a good reason why the *SEC should make it clear that any conclusions it may draw about gas and electric financing are to specifically exclude telephone companies from their application.*

Telephone companies throughout the United States, today, feel the impact of the pressure for high debt financing agitated by rate case witnesses hired by cities and states to fight telephone rate increases. In a case now going on in Mississippi, professional witnesses for the public service commission have contended that the electric utility business *is actually a more risky enterprise than the telephone business.* Witnesses for the Southern Bell Telephone & Telegraph Co. contend that there is no statistical evidence for such an assumption, and that the contrary is manifestly true.

However the Mississippi commission or courts may decide this particular case, it is an example of the type of argument that telephone companies everywhere will run into, more and more, if that argument should be fortified eventually by an SEC report suggesting any indiscriminate increase in the permissible levels of utility company debt ratios.

Bell Pension Plan Upheld

It is perfectly legal for a telephone company pension plan to contain a downward adjustment of retirement payments to offset increases in Social Security retirement benefits. The Bell System employe pension plan, as it formerly operated in relation to Social Security benefits, has been approved by the courts. This was the net result of the action taken by the U. S. Supreme Court on Nov. 19 in refusing to review the decision of a lower federal court, which held in effect that private pension payments may go down as Social Security benefits go up.

The case involved seven retired employes of Illinois Bell Telephone Co., as well as the parent, American Telephone & Telegraph Co., and the affiliated Western Electric Co. The seven employes contended that the Bell System's pension plan improperly cut retired payments in 1950 after Congress had increased Social Security old-age benefits. Under the offset arrangement, the employes claimed, the higher old-age payments authorized by Congress benefited the Bell System, rather than its retired workers. They complained that Bell "used the cost-of-living allowances by Congress in 1950 to decrease its own obligation to its pension fund."

The seven employes challenged the offset method of integrating private pension payments with Social Security benefits and asked the lower court to order the Bell System to reimburse them for the amount of the reduced pension payments. The lower court ruled, on the contrary, that the offsets were valid. The offset system is still widely used by corporations other than the Bell System. But, this is the first time the courts have passed on the legal problems involved in the adjustment of private pension plans and Social Security payments. Since this court action was started, however, the Bell System has changed its plan so that now a retired employe's private pension payments are *not* reduced after his retirement, regardless of changes made in the Social Security payments.

Push-button World

"Automation" is an ugly word which apparently sprang up in a Ford Motor Co. plant shortly after the war. It has been worming its way into the discussions and plans of dozens of our major industries and labor union movements ever since. There still exists considerable confusion over precisely what it

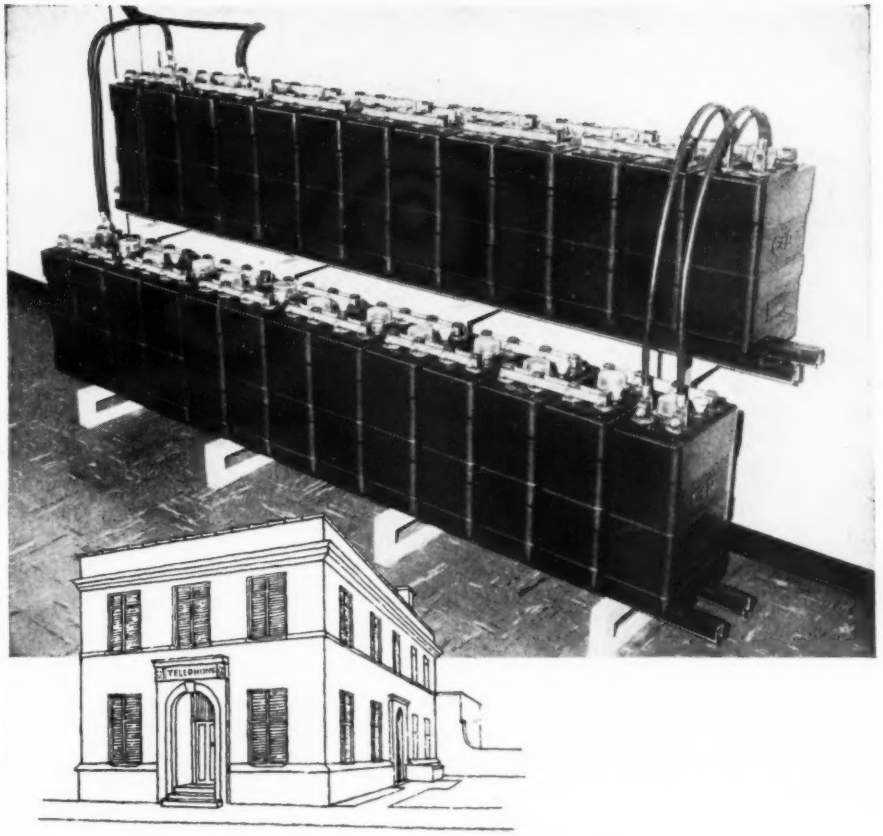
is supposed to mean. That is to say, it seems to mean different things to different writers and speakers.

In one context, for instance, automation would appear to be a production technique for taking over more and more of the final assembling and testing of finished industrial end-product units. In other contexts, it suggests the banishing of living intelligent workers from more and more processes, leaving the remainder of the living jobs to workers without brains. That is, they do not seem to need brains to do what there will be left for them to do.

To the businessman as well as the general non-scientific or non-engineering reader, who may have a guilty conscience about all this because he still does not have a clear idea of what all the shooting is about, a recent small (158 pages) volume is recommended by this correspondent. It is called "The Push Button World," published by the Oklahoma University Press at Norman, Okla. ($3.75). It is a collection of six lectures recently given at the University of Oxford on various aspects of "automation" by recognized experts. It is ably edited and summarized by E. M. Hughes-Jones.

The Oxford lecturers appear to agree on a basic distinction between the older processes known as mere labor saving devices, or mechanized operations, and the new concept of "automation," even though the real difference may seem important only to a matter of degree, in the final analysis. Under the older industrial regime, a series of mechanized operations turned out individual parts (such as refrigerator, or automobile parts) for ultimate assembly by living workers. Now, the automatic process has been carried so far down the assembly line, so to speak, that even such a complicated end-product as a radio or television set can be finally put together, tested, and packaged for shipment "without being touched by human hand."

Much more than that, the really up-to-the minute automation set-up can accept instructions laid out on punched cards or tapes. It can correct its mistake. In the more advanced realm, machines have been devised to play chess, keep complicated accounts, compose a formulistic sort of music, and accurately index such abstract literary materials as the writings of St. Thomas Aquinas. The Oxford lecturers tell about these marvels, even though they may not explain it all to the point of crystal-clear understanding of all readers. Here in Washington, D. C., experts at the Georgetown University Institute of Languages are working on a machine which will actually trans-



Creston Mutual Telephone converts to XY dial system

installs C&D PlastiCal® batteries for extra-long life!

The Creston Mutual Telephone Company, Creston, Iowa, is proud of its new Stromberg-Carlson XY dial system. And—the accompanying batteries shouldn't require replacing for 25 years, because Creston installed PlastiCal®—C & D's lead-calcium* battery.

Here in the heart of America's corn belt, Creston serves 4250 subscribers from offices in Creston, Orient, and Spaulding. In choosing famous C & D PlastiCal batteries Creston obtained:

1. **One-piece, permanently-sealed plastic case. Entire unit is shock-resistant, lighter, and more compact than glass or rubber.**
2. **Exclusive suspended and supported plate construction eliminates leaks due to internal stresses.**
3. **Easier maintenance, because patented Post Seal eliminates acid creepage.**

Get complete details!

Bulletin T-528 gives the full story on extra-long life C & D PlastiCal batteries. Bulletin T-527 has complete facts on C & D PlastiCell (lead-antimony) batteries.

**A development of the Bell Telephone Laboratories*

C&D BATTERIES, INC.
of Conshohocken, Pa.
SINCE 1906

C&D BATTERIES, INC. 1906-1956 50th ANNIVERSARY

SALES AND SERVICE OFFICES IN PRINCIPAL CITIES FROM COAST TO COAST

XUM

- Reaches hard to get at spots
- Bores holes up to 10 feet deep from any truck position
- Low cost—easy to use—easy to transport
- Industry tested and accepted

DIG HOLES—SET POLES WITH YOUR LINE TRUCK AND
TEL-E-LECT'S POLE HOLE DIGGER

When your derrick truck is equipped with a Tel-E-Lect Digger, your crew can dig a hole and set a pole in less than five minutes! This rugged auger, suspended from a front or rear mounted derrick, is raised or lowered by the winch line. Auger rotation power is supplied through a telescoping drive shaft connected to the PTO.

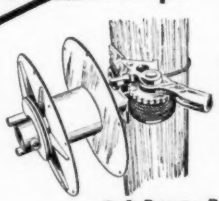
This efficient digger reaches up on a hill, down into ditches, or across obstacles . . . anywhere up to 20 feet behind the truck. The interchangeable hardened steel augers, 8" to 20" in diameter, are built to operate under the most rugged soil conditions.

Tel·E·Lect PRODUCTS, INC.
10,007 Minnetonka Boulevard Minneapolis 26 Minnesota

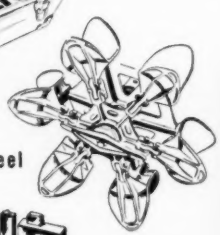
GENERAL MACHINE PRODUCTS COMPANY, INC.
7th & Wood Sts.
Philadelphia 6, Pa.

Aerial Tents
Cable Benders
Cable Blocks
Cable Lashers
Coaxial Cable Tools
Lashing Wire Clamps and Grips
Portable & Power Reels

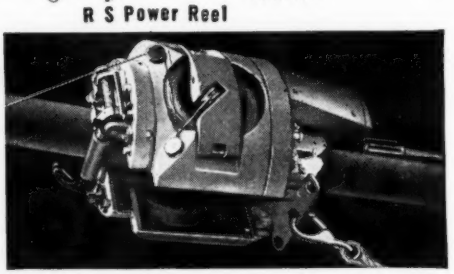
Pressure Testing Kit

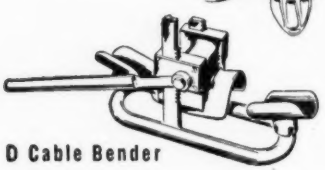


R S Power Reel



C R Power Reel





D Cable Bender

Distributed by Graybar

B, C, D & E Cable Lashers

Special Purpose Tools To Specifications
Literature on Request

Over 250 various items of Line Construction Tools, Maintenance & Pressure-Testing Equipment in stock for immediate Shipment

SPECIALIZED COMMUNICATIONS EQUIPMENT SINCE 1918 GMPCO

late Russian into English and vice versa, and the same with other foreign tongues.

But, does this represent actual mechanized thinking? No! The Oxford lecturers all agree on this and on the further proposition that there will be no such thing in the future. Always the problems must be laid out for the machines.

The Oxford experts agree (with some overlapping and duplication of thought) that there will be a demand for new skills, a certain amount of changing from one kind of job to another, and at worst a certain amount of temporary displacement. But there will be no displacement of the human mind. Only man himself has the intelligence (?) to devise his own ultimate destruction. He just cannot pass that responsibility on to the machine, any more than he could invent a housefly that could swat itself.

Missouri Independent Asks To Purchase Another

The Urbana Telephone Co. asked Missouri Public Service Commission permission on Nov. 9 to buy the Wheatland Telephone Co. and borrow $593,000 from the Rural Electrification Administration.

The company plans to convert to automatic service. To secure the loan, the Urbana company asked authority to issue 800 more shares of its $50 par, 6 per cent preferred stock.

Federal Telecommunications Leases Additional Space

Federal Telecommunications Laboratories division of The International Telephone & Telegraph Corp. has entered into a lease for approximately 11,000 square feet of ground floor space in the Botany Mills property in Passaic, N. J.

Federal Telecommunications, with principal offices in Nutley, N. J., will occupy the newly acquired space for the warehousing, storage and shipping of electrical equipment and allied products.

Asks Utility Strike Ban

"The arguments for a ban on nationwide strikes are strong. One thing Congress should do by all means is to follow the example of several states and ban strikes in public utilities. Here is a field where compulsory arbitration seems to be the only remedy. Strikes against public utilities are intolerable, but there must, of course, be some sort of machinery for redress of grievances." — EDITORIAL STATEMENT, *Los Angeles Times.*

IT'S SMART TO SAVE
WITH QUALITY
BUCKEYE RECONDITIONED
EQUIPMENT

Thrifty Purchasing Agents are finding Buckeye Reconditioned equipment the answer to maintaining plants on a budget. And you will find that you can count on Buckeye's long experience to put quality and service into every part. Let us know your requirements, we'll save you money!

TELEPHONES
Federal No. 804-CW magneto
S.C. No. 1212 with harmonic or straight line ringers
W.E. No. 302 with 5HA dials and S.C. No. D-2993 synchromonic ringers 16, 30, 42, 54 & 66 cycles
Type "C" magneto handset wall 3 bar
Type "C" magneto handset wall 5 bar

RELAYS (line & cut-off)
W.E. Nos. A-1, A-2, AB-4, AB-6
Kellogg Nos. 2029-SAH, 2048-SR
Kellogg Nos. 2029-CEY, 2048-SR
Kellogg Nos. 2029-SW, 2048-SV
S.C. Nos. 194-A, 193-BB
A.E. (small type) MC-9955-A & B

LET US KNOW YOUR SPECIFIC NEEDS . . . WE MAY HAVE IT IN OUR STOCKS

PLUGS
W.E. No. 289-A operator
Kellogg No. 182 operator
S.C. No. 23 operator
S.C. No. 53-X switchboard
W.E. No. 310 switchboard
W.E. No. 47-A switchboard

PROTECTION
W.E. Nos. 1268 A or B, 1269-A
A.E. No. D-67500
Cook No. 100
W.E. Nos. 28 & 29 protector blks
W.E. No. 76-A heat coils

COILS
W.E. Nos. 76-A, 25-A repeating
W.E. Nos. 94-E, F repeating
S.C. No. 11-A repeating
W.E. Nos. 13, 113-D induction

RECEIVERS & TRANSMITTERS
W.E. No. 635-A transmitter
W.E. No. F-1 transmitter
W.E. No. HA-1 receiver
Kellogg No. 65-A with headband
S.C. No. 27-A with shell, cap & cord
S.C. No. 24562 trans. for 1212 phone
S.C. No. 34242 recv. for 1212 phone

BLOCKS, TERMINALS
Nos. 65, 142-A, 224-A, 224-B

DROPS & JACKS
W.E. No. 22-C on 89-B mtg (5 per)
Kellogg No. 301-DJE on 329 mtg (10 per)
Kellogg No. 509-DJE on 495 mtg (10 per)

JACK STRIPS
W.E. No. 295 on 112 (20 per)
W.E. No. 295 on 136 (10 per)
W.E. No. 141 on 112 (20 per)
W.E. No. 141 on 115 (20 per)
W.E. No. 141 on 136 (10 per)
W.E. No. 193 on 122 (10 per)
Kellogg No. 267 (10 per)
Kellogg No. 269 (10 per)
Kellogg No. 324 (10 per)
A.E. No. 42428-EO (20 per)
A.E. No. 42428-A4 (10 per)
S.C. No. 135 on 80 (10 per)
S.C. No. 134 on 80 (10 per)

LAMP STRIPS
W.E. No. 12 on 137 (20 per)
W.E. No. 12 on 134 (10 per)
W.E. No. 12 on 125 (10 per)
W.E. No. 43-A on 278-B (20 per)
Kellogg No. 25 (20 per)
S.C. No. 121 on 80 (10 per)

SWITCHBOARD
W.E. No. 506-B Cordless PBX. 5 trunks, 12 lines, 5 connecting circuits. Trunks for dial or manual service.

WE REPAIR ALL TYPES OF SWITCHBOARDS AND TELEPHONES OR THEIR COMPONENT PARTS. PROMPT, ACCURATE SERVICE ON SMALL AND LARGE ORDERS.

It Pays to Call BUTELCO First!

BUCKEYE TELEPHONE & SUPPLY CO.

1250 KINNEAR RD. **COLUMBUS 21, OHIO**

XUM

NO TIME WASTED

WITH *Wheelock* CODE CALL

for instant communication

just press the button!

WALK — DON'T RUN TO THE NEAREST TELEPHONE . . . The WHEELOCK CODE CALL permits instant communication by means of audible signals, with personnel away from desks or with employees who normally cannot be reached directly by telephone. The busy switchboard operator just presses the button; a numerical *code call* sounds off throughout the building and the person being paged responds via the nearest telephone. Easy to install with any desired combination of chimes, bells, horns and other signalling devices.

Write for Bulletin 4B4

Engineering Representatives in Principal Cities

Signal Engineering & Mfg. Co., has changed its name to

Wheelock SIGNALS INC.

CODE CALL — LONG BRANCH, N. J.

CONTINUING IMPROVEMENTS IN THE

Murphy "ONE-MAN" Cable Tester

MODEL TTB

MODEL CMUW

ONE MAN WORKING ALONE

Can Now Identify Non-Working Cable Pairs 3 times faster than 2 men working together.

DISTANCE: 2 feet to 40 miles

***The Combination Tag-and-Terminating Board,* showing cable pairs properly connected. Tips — Horizontally, RINGS—Vertically.**

The NEW MODEL CMUW

The new weatherproof gasket sealed case is now a part of every MODEL C shipped.

WE SELL DIRECT ONLY TO DOMESTIC CUSTOMERS

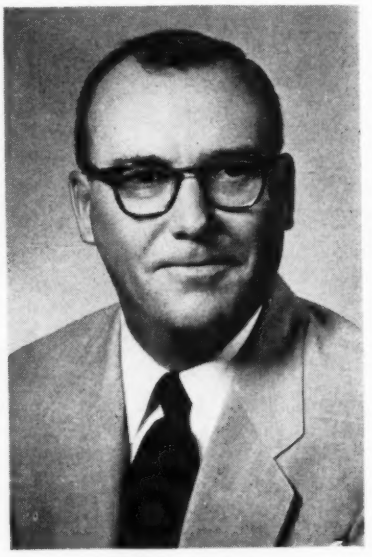
Foreign Customers See Your Export Agent or Write Us

MURPHY ENGINEERING LABORATORIES, INC.

4419 Tulsa — Houston 24, Texas

Philippine Company Elects Two Vice Presidents

H. W. Reed has been elected vice president and general manager and Thomas Matthews as vice president and controller of the Philippine Long Distance Telephone Co., according to an announcement made in New York on Nov. 14 by C. H. McLean, president. Headquarters for both of these vice presidents will be in Manila, Philippines.



H. W. REED

THOMAS MATTHEWS

Mr. Reed and Mr. Matthews have served for many years in the telephone business in Independent properties outside the United States. The Philippine Long Distance Telephone Co. provides local and long distance telephone service throughout the Philippines.

Daily Refinement

"Mistake, error, is the discipline through which we advance."—CHANNING.

XUM

Order From Suttle Today

DON'T GET CAUGHT WITH YOUR STOCKS DOWN

Leading Brands of Telephone Supplies, Tools, and Accessories

Specialized Printing for Exclusive Telephone Use

Specialty Distributors of
TFA (Danish) Switchboard Plugs
Van-Webb Hydraulic Pole Jacks

Manufacturers of
Suttle Ready Wire Reels
Dillon Bisector—Loud-Ringing Bells
3-Way Switching Keys

Specialized Service for the Small and Medium-Sized Independent Telephone Co.

WRITE FOR CATALOG IF YOU DON'T HAVE IT

SUTTLE EQUIPMENT CO.

LAWRENCEVILLE, ILLINOIS—Phone 782-783

AND NOW—

Three Big ABC BOOKS

For Your Training Program!

Buy ABC OF THE TELEPHONE — VOLUME THREE to bring your ABC Series up to date.

TYPICAL ARTICLES in each book include:

VOLUME I—20 CHAPTERS. Basic Circuits, Transmitters, Receivers, Line Protection.

VOLUME II—21 CHAPTERS. Fault Locating, Relay Circuit Analysis, Loading Coil Theory.

VOLUME III—31 CHAPTERS. Storage Batteries, Electronic Tubes, How to Read Circuit Drawings.

Every telephone man should have the complete ABC Series. In the three volumes—284—8½x11 pages. Hundreds of illustrations—72 Chapters! It's the big telephone training value.

Reprinted from the popular series, by Frank E. Lee, currently appearing in TELEPHONY.

Number of Copies	VOL. I	VOL. II	VOL. III
1— 5 copies	$1.50 ea.	$1.50 ea.	$2.50 ea.
6— 25 copies	1.35 ea.	1.35 ea.	2.25 ea.
26— 50 copies	1.20 ea.	1.20 ea.	2.00 ea.
51— 500 copies	1.05 ea.	1.05 ea.	1.75 ea.
501—1000 copies	.95 ea.	.95 ea.	1.60 ea.

SEND US YOUR ORDER TODAY—

Frank E. Lee, Publisher

1751—183rd Street Homewood, Illinois

PAGE LASHING WIRE

You get a neat and long-lasting job every time you use PAGE Stainless Steel Lashing Wire! Ideal for lashing conductor cables (lead or neoprene covered) to a strand messenger by Neale or Western Electric Machine. Coils tailored to fit machine specified.

3 GRADES • EACH IN 2 SIZES (.065 and .045)

Type 430 • for use with galvanized messengers
Type 302 • for use with stainless messengers
Type 316 • for use under severe corrosion conditions

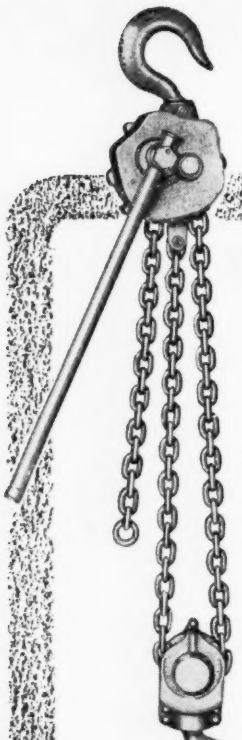
Furnished six coils in cardboard carton (minimum order).

Other fine-quality products • You can depend upon PAGE Strand (Stainless or Galvanized Steel) and PAGE Stainless Dead-End Wire • See your Telephone Supply Distributor, or write our Monessen, Pa., office.

Page Steel and Wire Division
AMERICAN CHAIN & CABLE

ACCO

Monessen, Pa., Atlanta, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Portland, Ore., San Francisco, Bridgeport, Conn.



The most efficient, lightest, safest hoist in its capacity class available!

Coffing Super Power

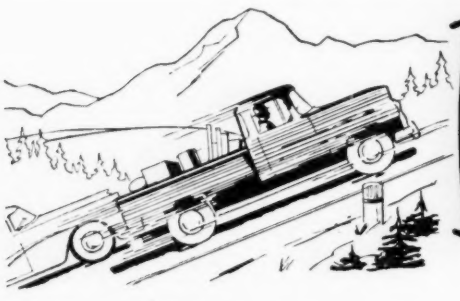
The Coffing Super Power coil chain hoist is more efficient (85%), more compact, has the greatest power-to-weight ratio and the highest safety factor (5) of any ratchet lever hoist available. This is possible because of Coffing's exclusive design which uses patented, compound hardened alloy steel levers instead of bulky, heavy gears.

An extra feature is the "safety valve handle" which bends at point of maximum safe overload—may be adjusted for length and operated from either side. It can't spin out of control.

Super Power hoists are available in 6 models from 1½ to 5 ton capacities. For greater hoisting efficiency and safety, ask your recognized distributor for Coffing Super Power hoists. For information, write Coffing Hoist Division, Duff-Norton Co., 808 Walter Street, Danville, Ill. Ask for Bulletin SP.

COFFING HOIST

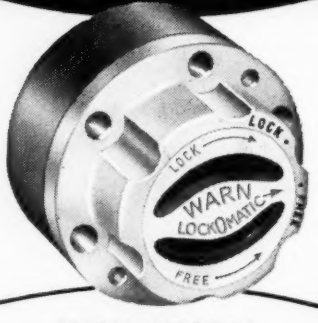
DIVISION OF **DUFF-NORTON COMPANY**



GET MAXIMUM USE OF YOUR 4-WHEEL DRIVE!

SAVE ON EQUIPMENT... SAVE GAS, TIRES, REPAIRS

Warn Hubs on your 4-wheel drive make 2 vehicles out of 1, because you can use it as a light duty 2-wheel drive pickup, or 4-wheel drive work horse. Warn Hubs save gas, tires, repairs; stop front gear whine and shimmy in 2-wheel drive—and you have 4-wheel drive whenever needed. Automatically, too, with Warn Lock-o-matics! They select free-wheeling 2-wheel drive or tractive 4-wheel drive *as you shift!* When road conditions change, you just keep right on going *in whatever drive is required.* With Warn Hubs, whenever you use 2-wheel drive you're saving on operating costs — and because you have 4-wheel drive too, it's the only light vehicle you need! Lock-o-matic (and Locking) models for all makes 4 W. Ds. to 1½ tons. See Warn Hubs at your dealers, or write:



NEW WARN LOCK-O-MATIC HUBS

Give your 4-wheel drive automatic free-wheeling 2-wheel drive—and automatic 4-wheel drive forward and reverse

AS YOU SHIFT!

WARN MFG. CO., Riverton Box 6064-TY12, Seattle 88, Wash.

G. K. Stenner Assigned to Dominican Telephone Co.

Gordon K. Stenner, formerly export district manager of International Automatic Electric Corp., has been appointed plant superintendent of Compania Dominicana De Telefonos in Ciudad Trujillo, Dominican Republic.

G. K. STENNER

Compania Dominicana De Telefonos is a part of the General Telephone System.

A native of Vancouver, British Columbia, Mr. Stenner began his telephone career as an installer with Canadian Telephone & Supplies, Ltd. Joining the Automatic Electric group in 1949 in an installer capacity, he served in Uruguay, Aruba and Haiti. In 1954, he was appointed staff engineer in carrier and radio sales, and in 1955 was named export district manager for the International organization.

To Head Willys Advertising, Merchandising Program

The appointment of C. W. Grinstead, as director of advertising and merchandising for Willys Motors, Inc. was announced recently by C. A. Watson, general sales manager.

An executive with the corporation in various key capacities since 1945, Mr. Grinstead for the past two years has been manager of the Willys central division with headquarters in Chicago.

Mr. Grinstead, whose automotive experience dates from 1934 when he was associated with the International Motor Truck Co., has since been engaged in both domestic and export automotive sales capacities. During World War II he served the War Department as an automotive advisor. Immediately prior to his Chicago assignment, he served as general manager of Willys Canadian company.

C. W. GRINSTEAD

In his new position, he will have overall direction of a stepped-up advertising and merchandising program to promote the new "Jeep" series to be introduced by Willys as an addition to its present line of 4-wheel drive vehicles.

A. B. Chance Adds New Sales Area; Names Manager

The A. B. Chance Co. of Centralia, Mo., announces the establishment of a new sales region and the appointment of Frank C. Voelker as regional sales manager. This new region includes

F. C. VOELKER

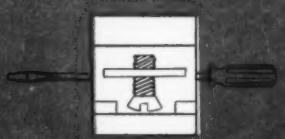
Michigan, Indiana, Kentucky, Ohio, the western half of Pennsylvania, and parts of Virginia and West Virginia.

A Chance sales representative the past year, Voelker joined the Chance company from the Seyler Mfg. Co. where he was sales manager for 10 years. The new regional sales office will be located in the A. B. Chance Co.'s Pittsburgh plant, P. O. Box 9557, Etna; Pittsburgh 23, Pa.

ADD COLOR IN

30

SECONDS



To CONVERT a Stromberg-Carlson standard black 'phone to tu-tone, all you do is loosen one screw, remove the black housing, put on the colored housing and tighten the screw. Choice of 8 handsome colors.

Another profitable reason to standardize on Stromberg-Carlson telephones

Better today - better tomorrow!

Wouldn't you like to effect this kind of inventory saving in your company?

XY

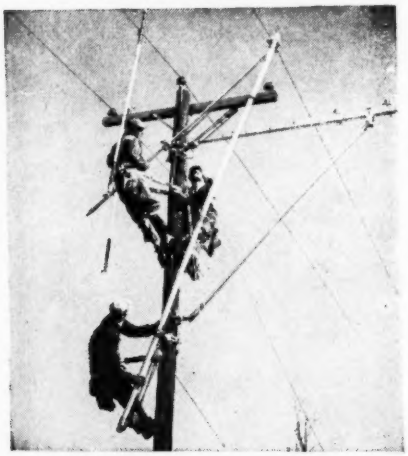
STROMBERG-CARLSON COMPANY

A DIVISION OF GENERAL DYNAMICS CORPORATION

Rochester 3, N.Y.

Bashlin's Quality

FOR OVER 30 YEARS



TOOLS OF SAFETY . . .

BASHLIN Quality Body Belts with the additional Nylon Safety Feature . . . Work Safely . . . Comfortably . . . with tools in easy reach.

BASHLIN Quality Alcoa Aluminum Alloy Adjustable Climbers with replaceable gaffs . . . There is nothing better anywhere!

BASHLIN'S Nylon and leather Safety Straps . . . Bashlin Quality, of course.

You Can't Afford Anything LESS Than the BEST—

Buy **BASHLIN**

Highest Quality For Over 30 Years

Distributors in Strategic Areas in U.S.A.

EXPORT: Copperweld Steel International Co.
IN CANADA: Bell Electricord & Safety, Ltd., Toronto

Ask for . . .
CATALOG NO. 56

W. M. BASHLIN CO.
GROVE CITY, PA.

The addition of this new region brings the Chance regional divisions to six. Headquarters of the other regions are located in San Francisco, Cal.; Dallas, Tex.; Chicago, Ill.; New York, N. Y., and Atlanta, Ga.

Holan of Georgia Makes Three New Appointments

Three new men, including a vice president in charge of sales, have been appointed to Holan Corp. of Georgia, Griffin, Ga. The announcement was made by J. Howard Holan, president,

R. R. RECTOR

and Victor H. Warner, vice president and national director of sales, of J. H. Holan Corp., Cleveland.

Robert R. Rector is the new sales vice president. He comes to Holan from

W. G. ROBERSON

McCabe-Powers Auto Body Co. where he was a southern sales representative for six years. Prior to that, Mr. Rector was affiliated with American Coach & Body in Cleveland. A former R. C. A. F. and Air Force Captain, he attended

JAMES JOHNSON

Findlay College and Ohio State University.

Two new salesmen are Walter G. Roberson and James Johnson. Roberson, who formerly worked for Murphy Body Works, Wilson, N. C., was in the army transportation corps for nearly

M. O. ROWE

three years. He attended Wake Forest College and Atlantic Christian College. Mr. Roberson is serving Holan customers in Georgia, Tennessee and Arkansas.

Mr. Johnson, a former Florida resident, has been a McCabe-Powers field representative in Northern Illinois and Wisconsin for two years. He attended Northwestern University. Johnson served as a radio technician in the army. His sales area will include Florida, Alabama and Mississippi.

Continuing as a fourth salesman in the Holan southern operation is M. O. Rowe, who handles Texas, Louisiana and Oklahoma.

COOK ELECTRIC COMPANY

A prominent producer in the advanced electronics field of the defense program, currently showing a sharp uptrend in earnings.

Our comprehensive memorandum will be sent upon request

BLUNT ELLIS & SIMMONS

MEMBERS
NEW YORK STOCK EXCHANGE
MIDWEST STOCK EXCHANGE

208 SOUTH LA SALLE STREET, CHICAGO 4
TELEPHONE FINANCIAL 6-4774

Telephone in *Quiet!* with a **BURGESS-MANNING** *"Hear-Here"* Booth

More than "just a phone booth," every Burgess-Manning "HEAR-HERE" Booth is a room of *"Quiet."* They have been carefully studied from an acoustic standpoint and you will completely eliminate all interfering outside noise when you step inside. And notice too—

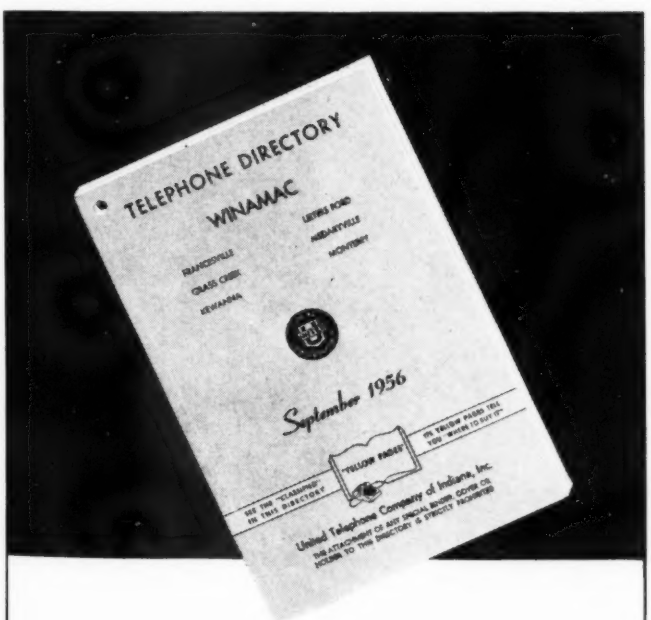
- **No doors** — always fresh air
- **No Corners** — to sweep
- **No glass** — to break

There's a model and size to fully satisfy your particular need. No other booths like the Burgess-Manning.

Performance Guaranteed

Write for Catalog—Bulletin

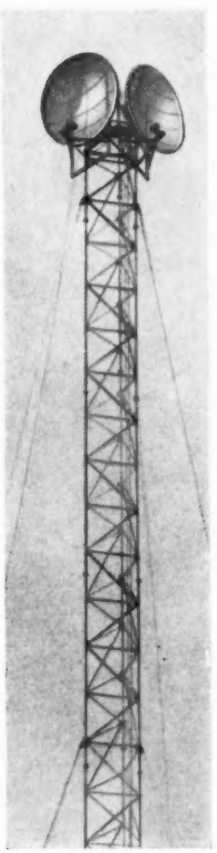
Architectural Products Division of
BURGESS-MANNING COMPANY
5956 Northwest Highway, Chicago 31, Illinois
Manufacturers of 3-Way Functional Ceilings and Acousti-Booths for Telephoning



A directory for the United Telephone Company of Indiana, Inc. printed by

R. R. DONNELLEY & SONS COMPANY

350 East Twenty-second Street, Chicago 16



S-C STROMBERG-CARLSON

Unusual Opportunity for

TEST ENGINEERS

Carrier and Microwave Experience

Experience in maintenance of carrier and microwave installations desirable.

We offer an unparalleled opportunity for rapid advancement in one of the fastest growing companies in the communications industry. And you'll like living in Rochester—a city of fine homes, superb schools, vast facilities for leisure-time activities.

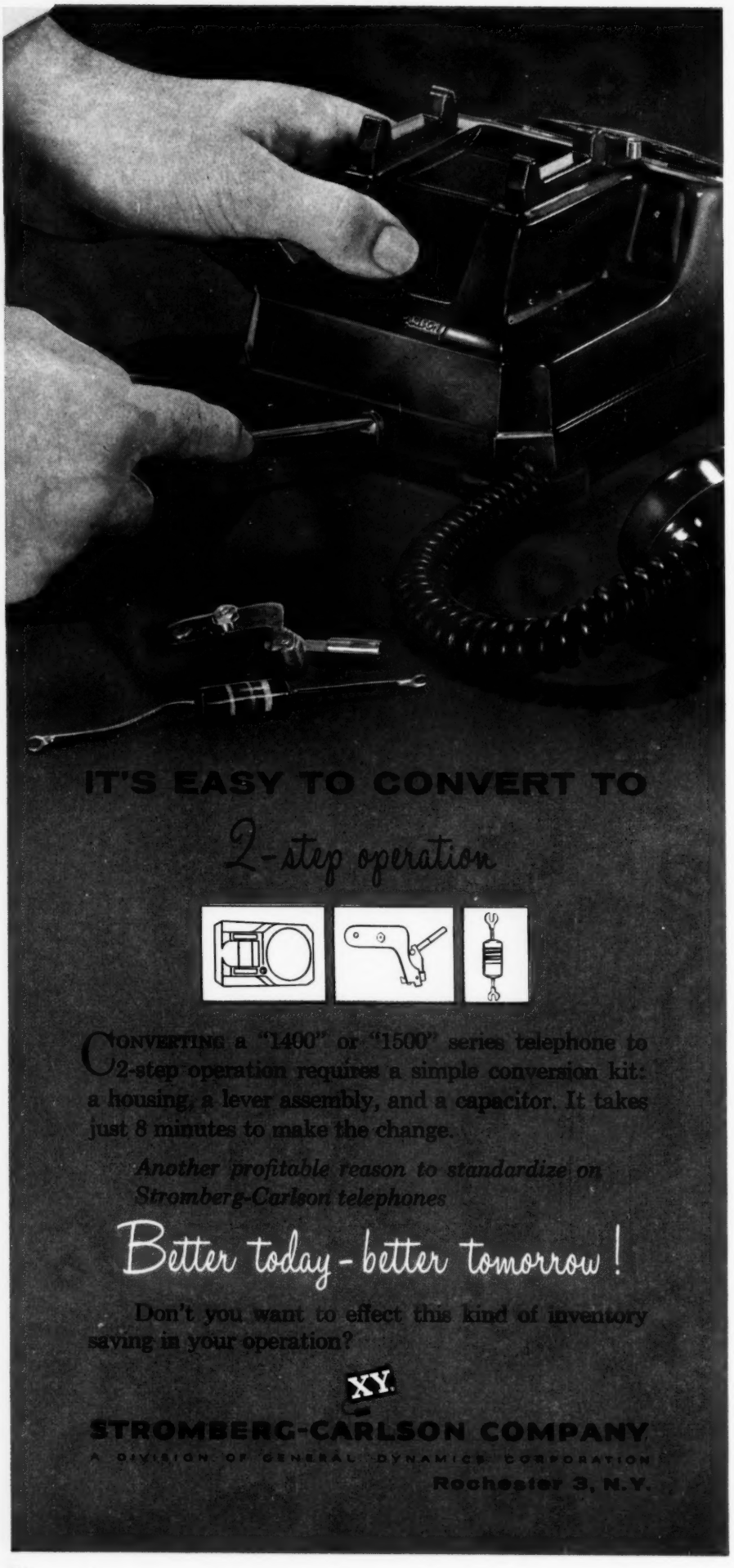
Immediate openings in Quality Control Dept. Other opportunities for electrical engineers in production engineering.

For immediate interview send letter or resumé to R. E. Golemb, *Quality Control Manager, Telecommunication Division.*

STROMBERG-CARLSON

A DIVISION OF GENERAL DYNAMICS CORPORATION

Rochester 3, N. Y.


IT'S EASY TO CONVERT TO
2-step operation
CONVERTING a "1400" or "1500" series telephone to 2-step operation requires a simple conversion kit: a housing, a lever assembly, and a capacitor. It takes just 8 minutes to make the change.
Another profitable reason to standardize on Stromberg-Carlson telephones
Better today - better tomorrow!
Don't you want to effect this kind of inventory saving in your operation?
XY
STROMBERG-CARLSON COMPANY
A DIVISION OF GENERAL DYNAMICS CORPORATION
Rochester 3, N.Y.

Automatic Electric Appoints Plasmier a Staff Engineer

G. C. Plasmier has been appointed a staff engineer for Automatic Electric Sales Corp.

Mr. Plasmier joined Automatic Electric in 1921 where he served in

G. C. PLASMIER

the installation, government sales and engineering departments. In 1946 he became an engineering supervisor, in 1955 was promoted to supervisor of equipment engineering, and in 1956 was named assistant to the superintendent of installation and service, the position he held prior to his present appointment.

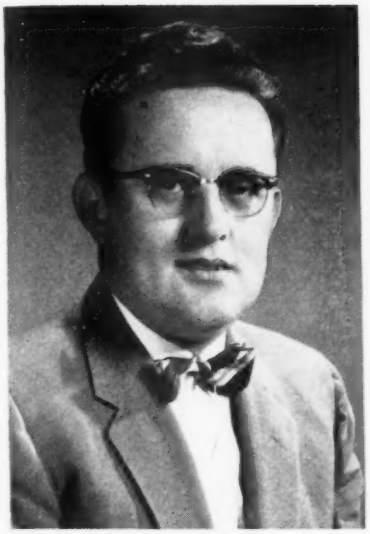
Mr. Plasmier is a member of the AIEE and a registered professional engineer in the state of Illinois.

Stromberg Names E. L. Gear To Post in Kansas City

The appointment of Elwyn L. Gear to the sales engineering staff in the Kansas City branch office has been announced by T. C. Thompson, general sales manager for the telecommunication division of Stromberg-Carlson, a division of General Dynamics Corp. Mr. Gear has recently spent some time at the company's headquarters in Rochester, N. Y., for specialized training, and has now assumed the duties of his new post in Kansas City.

Mr. Gear most recently has been traveling service engineer assigned to the territory covered by the company's Chicago branch. For the five years immediately preceding he supervised some of the largest installations of "XY" dial equipment in various parts of the country, including the territory he will now be serving.

Mr. Gear was born in Batavia, N. Y. He entered the U. S. Air Force in 1941, attended radio and radar mechanics



E. L. GEAR

school at Chicago and Scott Field, Ill., and later was appointed Communications Chief at Hunter Field, Ga. Upon separation in 1946 he was employed by the Western Electric Co. in Chicago until he joined Stromberg-Carlson in 1951.

Ohio Consolidated Names C. A. Bowen Division Head

Charles A. Bowen, of Marion, O., has been appointed division manager for the central division of Ohio Consolidated Telephone Co., which includes the Circleville, O., and Wilmington, O., operating districts. The announcement was made on Nov. 19 by the company president, Clare E. Williams.

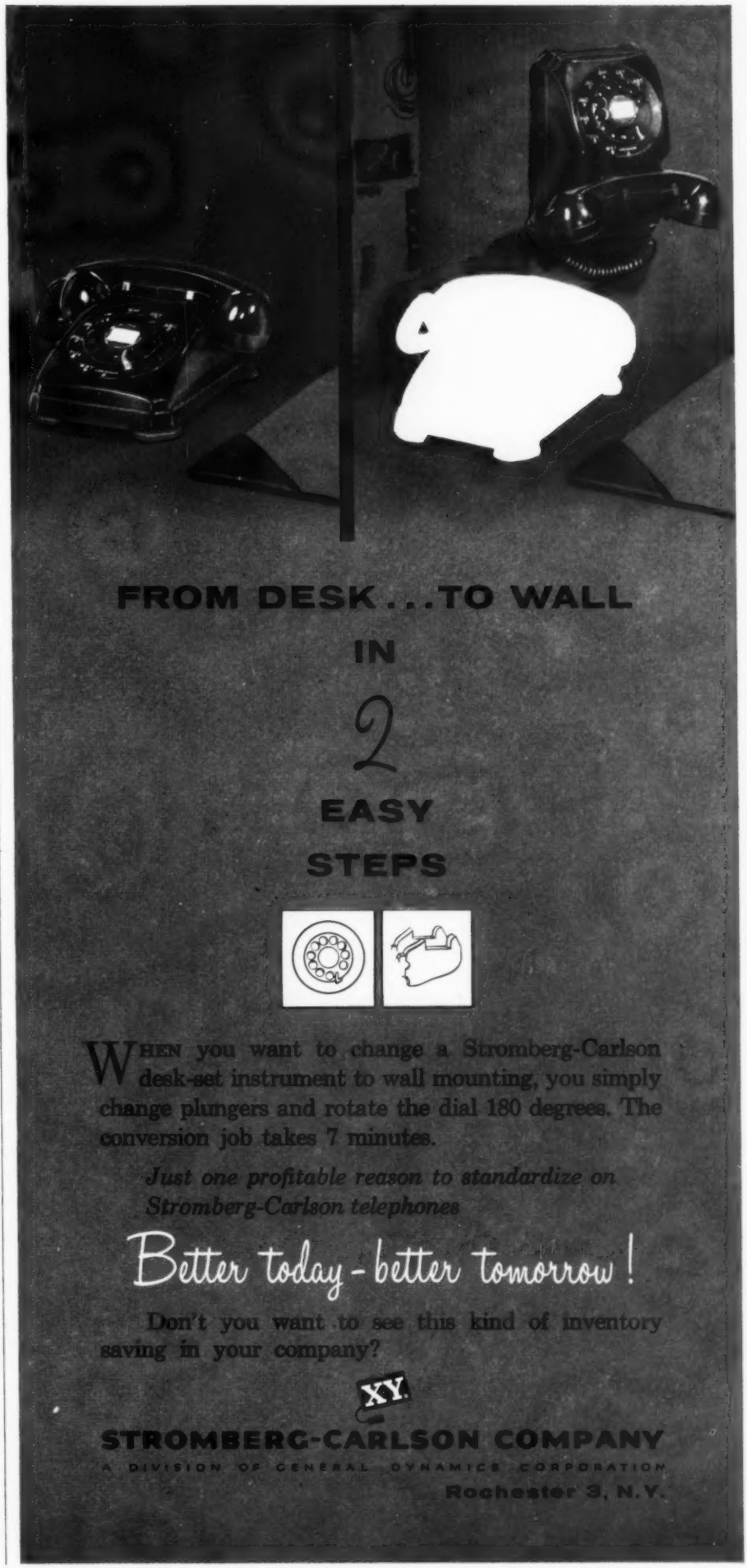
As division manager, Mr. Bowen will supervise all operations of the company throughout the 18 exchanges of the Circleville and Wilmington districts, including the construction of new and additional exchange and distribution facilities in those areas.

Mr. Bowen's telephone career began in 1937 in the maintenance department of General Telephone Co. of Ohio, where he served for five years. He subsequently became district plant superintendent for the company's Jackson, O., district, and in 1951 was appointed southern division manager for General.

Mr. Bowen was directly concerned with the establishment of the new, large and complex telephone system for the Atomic Energy Plant in Pike County which is served by General. In addition, Mr. Bowen supervised extensive construction of new and additional plant equipment including a number of exchange conversions to automatic operation.

In May 1956 he was transferred from Jackson to Marion, O., as central division manager for General of Ohio, the position he now holds.

Mr. Bowen is a veteran of World War II, having served 3 years in the European theatre.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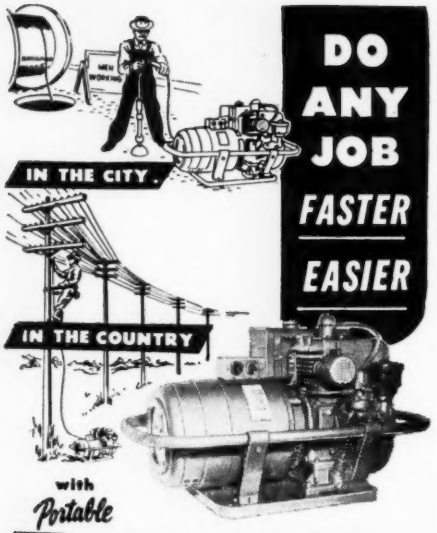

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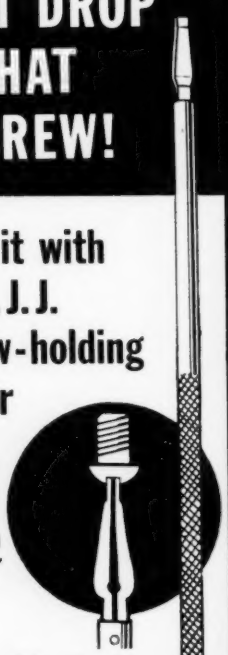

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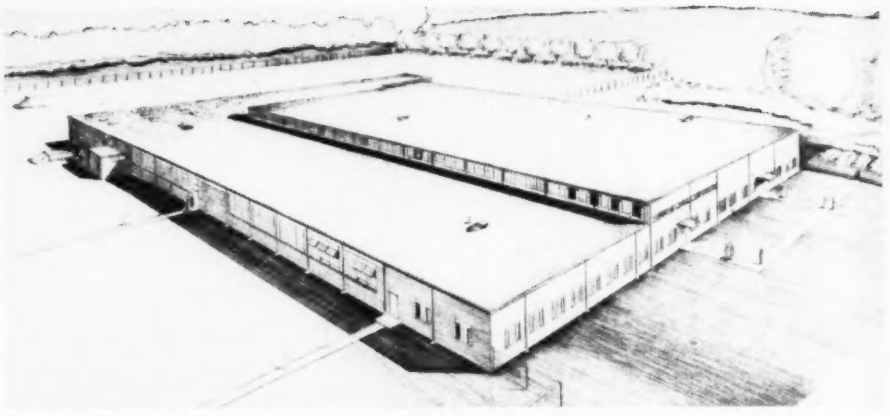


Superior Cable Corp. plant showing planned 43,000-square-foot addition.

Superior Cable Announces Expansion of Plant

R. Walker Geitner, president of Superior Cable Corp., Hickory, N. C., recently announced that contracts have been awarded for the construction of a 43,000-square-foot addition to the Superior Cable plant.

Actual construction is expected to begin on Dec. 10 and to be completed by June 15, 1957.

The addition is primarily manufacturing and office space. Also, installation of new machinery is planned which will make possible the production of a larger variety of communication cables by the company.

This will be the second such addition to Superior Cable Corp. since it began operation in May 1954.

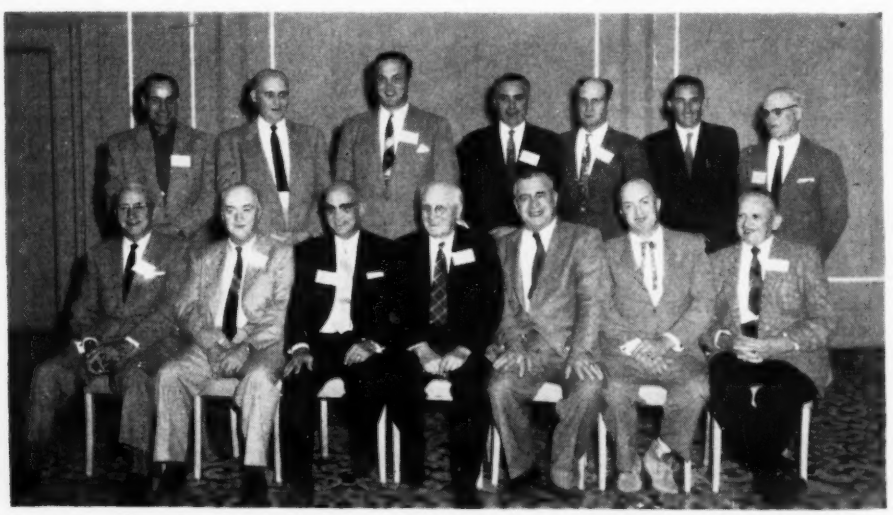
The Basic Premise

"Whether you call it a democracy or a republic, whether you judge its benefits by the car in your garage or by the freedom to worship at the church of your choice or by your freedom to speak out in public without fear, you are living under a system of government based on the dignity and freedom of the individual, that derives its powers from the bottom up rather than from the top down. . . . Like the stars in the sky, the continuation of this system is too often taken for granted."—*Port Huron (Mich.) Times Herald.*

Automatic Names H. C. Jones Installation Chief

Harry C. Jones has been appointed superintendent of installation and service at Automatic Electric Co., succeeding V. L. Bunkelman who has retired.

Born in Oklahoma, Mr. Jones spent most of his youth in Ault, Colo., and



Directors elected at the recent convention of the Rocky Mountain Telephone Association (for complete story see TELEPHONY, Nov. 10, p. 24). Standing, left to right: Robert Brown of Parma, Idaho; C. M. Hart, Kingman, Ariz.; Rulon Callister, Delta, Utah; Floyd L. Reyher, Haxtun, Colo.; Ward Blazzard, Kamas, Utah; Earle Crandall, Pinedale, Wyo.; C. W. Haas, Bigtimber, Mont. Seated, left to right: J. W. Baker of Coeur d'Alene, Idaho; M. O. Grego, Sundance, Wyo.; D. A. McLean, Denver, Colo.; T. Clark Callister, Fillmore, Utah; J. W. Corbin, Moab, Utah; R. A. Manuel, Browning, Mont.; C. A. Blakeney, Carlsbad, N. M. Absent when the picture was taken were: J. F. Monsen of Aberdeen, Idaho; J. F. Tipton, Espanola, N. M., and J. F. Thiele, Pagosa Springs, Colo.

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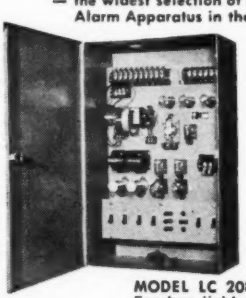

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H. C. JONES

attended the University of Colorado where he graduated with honors with a B.S. in E.E.

He joined Automatic Electric in December 1937 and has held the positions of project engineer, executive assistant to the chief engineer, executive assistant to the president, staff engineer, supervisor of government contract engineering, supervisor of systems engineering, assistant superintendent of engineering and assistant superintendent of installation and service, prior to his appointment.

He is a member of Eta Kappa Nu, honorary electrical engineering fraternity; Sigma Pi Sigma, honorary physics fraternity; American Institute of Electrical Engineers, and Alpha Sigma Phi.

Mr. Bunkelmen who was born and reared in Seymour, Wis., has been with Automatic Electric since 1915. Almost without exception, his telephone career has been in some phase of installation, either in the field or in the home office.

Political Catch Phrase Misses the Mark

"The advocates of socialized electric power development have a number of favorite catch words and phrases, which are being repeated *ad infinitum* in this political year. For instance, when a taxpaying independent power company is allowed to develop the power potential of a river, it is charged that this is a 'giveaway' of priceless public possession, and amounts to a steal of resources which belong to all the people.

"One of Oregon's leading newspapers, the *Salem Statesman*, which is published by a former governor of the state, has this to say on the subject: 'The phrase "steal our resources" is

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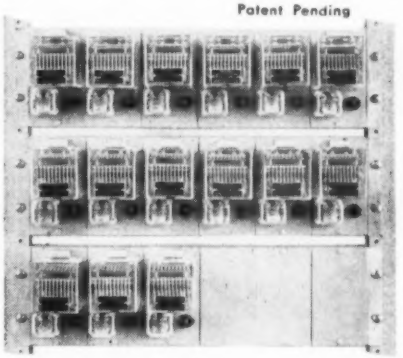

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quite prejudicial. A private company can begin a hydroelectric project only after obtaining a license from the federal power commission. It takes the risk of construction, raises and invests the required capital, distributes energy in compliance with law and regulation. It is subject to state regulation. Its earning power is definitely limited. It is required to amortize its plant investment in a federally licensed dam over a period not to exceed 50 years. Then the plant is subject to recapture, as at all times it is subject to government condemnation. It seems quite demagogic, therefore, to brand private utilities as "thieves" for developing a hitherto unused resource, when they are limited in earnings to a fair return based strictly on their prudent capital investment.'

"That is a sober and factual statement. However, as said before, we will continue to hear, *ad infinitum*, the socialists' catch words and phrases. And here another common Latin term applies — *ad nauseum*." — *Industrial News Review.*

Answers to Questions On Page 34

(1) The information operator should ascertain how many numbers he wishes.

(2) If the customer wishes not more than five numbers, the Information operator will obtain and record the details. She will request the calling number and tell the customer that she will call him. She will refer the list to her supervisor, who will obtain the desired information and give the customer the report.

(3) If the customer requests the telephone numbers of more than five subscribers, the Information operator will refer the customer to her Supervisor.

(4) If, in the Supervisor's judgment the list is not too long, she will obtain and record the details. She will request the calling number and tell the customer that she will call him. She will obtain the desired information and will call the customer and give him her report.

(5) The supervisor will obtain the customer's name and number, if she does not know it, and will tell him that she will have the chief operator call him. She will reach the chief operator of the office where the call originated and give her the details of the call. If the request was originated by a Long Distance operator, the chief operator will explain, since she has no record of nonpublished telephones, she cannot furnish the number.

Good Employe Relations

"Just as charity begins at home, any constructive effort to improve intercommunication generally depends on the success of efforts within individual companies—between individual managements and the unions with which they deal. . . .(However), communications between managers and labor leaders is no substitute for direct and regular intercommunication between managements and employes . . . even if good employe relations are sustained by effective communications, the need for good relations with union leaders still exists."—MARK W. CRESAP JR., *executive vice president, Westinghouse Electric Corp.*

Measure of Wealth

"The wealth of society is its stock of productive labor."—SIR JAMES MACINTOSH.

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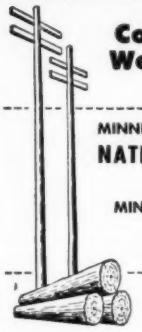
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No. 325-A Operator Jacks
No. 182 Operator Plugs

No. 154-U Red Lamp Caps
No. 154 White Lamp Caps

No. 2093-CEA Line Relay and No. 2059-CDG Cutoff Relay. Universal, convertible from magneto to common battery.

Relays: Nos. 2003-J, 2001-TJ, 2003-SEP, 2001-CDF, 2044-SET (many others)

Condensers: Nos. 64 and 132 types

WHATEVER YOUR NEEDS—CALL ON BUTELCO FIRST!

BUCKEYE TELEPHONE & SUPPLY CO.
1250 KINNEAR ROAD COLUMBUS 21, OHIO

FOR SALE

WESTERN ELECTRIC NO. 392 LOUD BELLS. Refinished and tested, with condenser — $6.00 each. Write Telephone Equipment, Inc., Montrose, Mich.

NORTH ELECTRIC CX-100 SWITCHBOARD, 2-5 numbering, seven years old, fully equipped, three extra links. Available June 1, 1957. Price $8,500, F.O.B. Chancellor, Va. For details call Sterling 6-2681 or write F & W Telephone Co., Chancellor, Va.

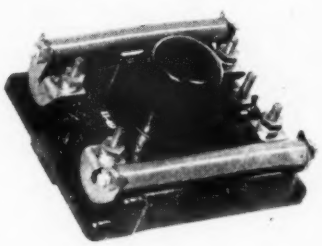
NEOPRENE JACKETED TELEPHONE CABLE
19AWG/10 Pair, Solid
1000 Ft. Reels
$60.00 M FOB
WILLIAM CERESKE COMPANY
468 Second Street
Oakland 7, California

RECONDITIONED EQUIPMENT

Leich #901—2500 Ohm.	@	$21.45
Leich #605—with A.E. Dials	@	$17.00
Western Electric #302 EW.	@	$14.00
W. E. #302 BW. W/5-H. Dial	@	$17.50
Leich #90A. W/ A.E. Dial	@	$10.00
Kellogg #1000 BC.	@	$14.00
NEW—A.E. Operators Transmitters, W/ Mouthpiece, & Neck Band	@	$ 3.00

Prices—F.O.B. Chicago, Ill.

Independent Telephone Repair Co.
2137 W. 21st St. Chicago 8, Ill.



RECONDITIONED
WESTERN ELECTRIC #98A

Station protectors, complete with two No. 11C fuses, Two No. 2G and Two No. 27 protector blocks

Price.....$ .75 each
Lots of 100.....$ .70 each
Lots of 500.....$ .65 each

RECONDITIONED
FEDERAL #804A

Magneto Compact set convertible to desk or wall. Equipped with capsule type transmitter and receiver. Can be used on long rural lines.

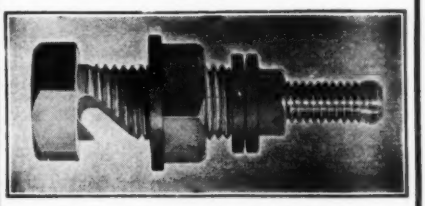
Shipped complete with terminal block and refinished battery box.

PRICE $18.50 EACH
12 or more—$18.00
Terms 2%—10 Days Net: 30

BOHNSACK EQUIPMENT CO.
GERMANTOWN, NEW YORK

FOR SALE

No. 6A WESTERN ELECTRIC TYPE Bridging Connector



⅛" Hex Steel Body (slotted for No. 10 B.W.G.) Washer and Nut all zinc plated. Brass stud with 2 brass washers held in place with a hex brass nut. For use on iron to copper wire.
Price per hundred.....$28.00
ALL SHIPMENTS F.O.B. PHILADELPHIA

CLEVERLY ELECTRICAL WORKS, INC.
5312 WESTMINSTER AVE.
PHILADELPHIA 31, PA.

FOR SALE
AT BIG SAVINGS
ON KLEIN TOOLS

A fortunate purchase makes it possible to offer these most used tools at tremendous savings.

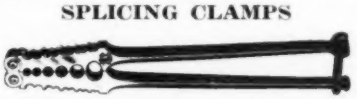
WIRE GRIPS

These grips are forged steel and guaranteed brand new surplus.
No. 1613-30 For wire from No. 12 to No. 6. Safe load 1,500# A $3.15 Value, Ea.....$2.19
No. 1628-5 For wire and strand from No. 4 to 4/0. Safe Load 8,000#.
$9.50 Value Ea. $6.90

HAVEN'S GRIPS

No. 1604-20 For W.P., bare wire and strand ½" in diameter and smaller. Safe Load 5,000#. A $4.40 Grip for just Ea.....$3.49

SPLICING CLAMPS



No. 132-15 For telephone and power work. Takes wire from No. 12 to No. 4. Copper splicing sleeves from No. 19 to No. 8, also a large hole for guy strand.
Sells for $5.75. Our price just.....$2.65

No. 102-30 For wire from No. 12 to No. 2. Has large opening for guy strand.
A regular $5.40 Value for Each.....$1.65

LINEMEN'S WRENCHES

BELL SYSTEM TYPE For ⅝" and smaller hardware. A $2.75 Value. While this lot lasts. Ea. $1.09.

QUANTITY DISCOUNT
LOTS OF 12 OR MORE OF ONE ITEM, LESS 10%. F.O.B. CHICAGO, ILL. SUBJECT TO PRIOR SALE.

LINE EQUIPMENT SALES
529 SOUTH DEARBORN STREET
CHICAGO 5, ILL.

FOR SALE

1,000,000 WAR SURPLUS INSULATORS AVAILABLE
SIGNAL CORPS No. IN56

Pyrex Glass, or Porcelain, double grooved, diameter 1½", length 2¼"—with metal lag screw attached, overall length 5¼". Minimum order 150. No quantity discounts. Until Jan. 1st, 3½c each, f.o.b. Denver or Salt Lake City. Free sample on request.

THE SUTTON CO.
1839 CHAMPA, DENVER, COLORADO

IN STOCK

★ **New type field wire,** D-1-A, tw. pr., 4 copper 3 steel strands per cond., plastic, nylon ins., latest army type tel. wire @ **$32.50/mile reel.** (Qty. discounts): FOB Destination.

★ **W-110-B, tw. pr., WP tel. wire;** 4 steel 3 copper strands per cond., on One Mile steel reels, UNUSED @ **$12.00/mile reel.** FOB Chicago.

★ **Magneto Ringer Boxes:** W.E., Kellogg, Stromberg-Carlson, 5 bar-1600 or 2500 Ohm @ **$6.50 each.**

★ **W.E. # 392—Loud Ringing Bells, WP,** outside or inside use, w/6" gongs and condenser @ **$8.50 each.**

★ **W.E. Operator Head & Chest set,** New, complete w/#396 trans., #716 Receiver, cords and #289-B plug @ **$8.00 each.**

****TELEPHONES:**

★ **W.E. #250-AW, desk handset telephone,** latest style, dial blanked for C.B. or magneto **$11.00 each.**

★ **Stromberg-Carlson, #1243, desk handset phone,** self-contained. C.B., dial blanked **$13.00 each.**

★ **Federal Telephone, FTR-804-A, Magneto, latest model Desk handset,** self-contained, easily convertible for Wall Use, Like New, completely Reconditioned with New cords @ **$18.00 each. Qty. of 12 @ $17.50 each.**

All Material in Excellent Condition and Fully Guaranteed.

Quantity Discounts Available!!!

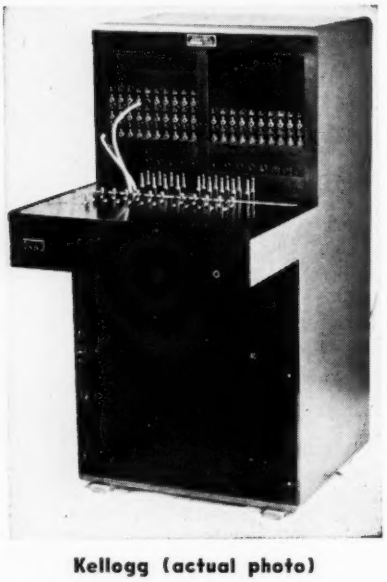
Other Makes of Telephones also in Stock.

Terms: 1% 10 days, NET 30; FOB New York.

Tele-Wire Supply Co., Inc.
Distributors of Telephone Supplies
146 Front Street New York 5, N. Y.
HAnover 2-9690

MAGNETO SWITCHBOARDS

WHY put up with a WORN-OUT switchboard? when you can buy a BRAND NEW one at 1/3 price?



Kellogg (actual photo)

Kellogg & Stromberg Carlson

←*(photo to left)*

New 100 line—50 equipped with combined drops & jacks, wired to 15' 51 pr. braid cable stub—Night alarm ckt. (no code alarm) 10 cord circuits (single supervised) with repeating coils. Standard-low type, 30" cordshelf (desk height) built for Navy—never used—Hardwood (birch or maple) cabinet, painted green.

Clean as a whistle—tested—
fully guaranteed $395
(as above, but slightly used, reconditioned $295)
additional line drops (per ten) $30
—circuit prints on request—
Terms if desired

Kellogg 180 lines capacity 15 cord circuits—single sup. wired & equipped with 100 line drops & jacks, rebuilt like new. Red mahogany cabinet—low type ..... $500.
additional lines, per ten ..... 30.

Western Electric #1240 type 165 line capacity—equipped as desired with new drops & jacks, cords & plugs—15 cord circuits (single supervised).

DROPS & JACKS

W.E. #22C new $2.00
—unused, discolored 1.00
5 #22C on 89B mtg. new 10.00
#1800 swbd. 10 drop & jack (#22C) section, new 20.00
—unused, discolored, tested 10.00
Stromberg-Carlson #11A Drops & Jacks on 140 mtg. (5 per strip) 15.00

Plugs, W.E. #47, new ..... $ .50
#347, new ..... .75

Cords, red, white, green ..... .50

Repeating Coils

W.E. 27A, non-ring thru 3.00
25A, non-ring thru 5.00
70A, ring-thru, large 5.00
76A, ring-thru, double 5.00
77A, ring-thru 3.00
91A, ring-thru, double 10.00
93A, ring-thru, double 10.00
94E, F, G, S, non-ring-thru 2.00
120 types 3.00
Kellogg #19A, B, #20A 3.00
(many others, all mfg.)

PLAN TO CONVERT
Magneto to Dial

Start now by using CB phones in town—one of these coils connected to each drop, thru condenser to common battery will provide CB service on that line.

Subscriber signals operator by lifting handset and rings off by restoring it.

—KICK-COILS—

KELLOGG

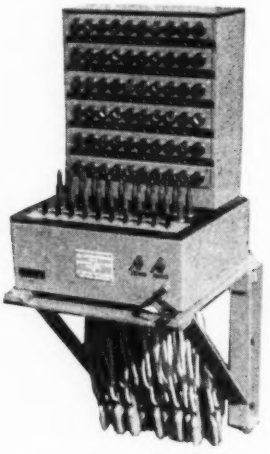
C-111

Brand New, ea. $3.00
Lots of ten, ea. 2.75
Lots of fifty, ea. 2.50
Lots of 100, ea. 2.00
Mounting Strip—(10 coil) 19" rack 2.50
Used coils, A-1 ..... 2.00
Condensers, 2 M.F. ..... .75

Batteries, storage, Gould 14 volt dry charge—add electrolite 10.00
(use one, or two if lines are long)

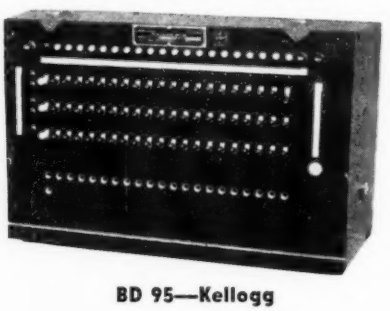
Telectric Co.
1218 VENICE BOULEVARD
LOS ANGELES 6, CALIF.
Richmond 8-2249

ELECTRONIC MAGNETO TYPE
(No Drops or Relays)



50 line (magneto) Lamp Neon operates directly from 115 volt AC power, thru Selinium rectifier, 18½" high, 11½" wide, light weight. Excellent as PBX to Mag. exchange, with LB or CB Phones (with kick coil). Complete with mtg. bracket, power supply, W.E. handset & spares, U.S. Navy ..... $150.

CORDLESS LAMP



BD 95—Kellogg

Ideal for PBX from Mag. CO

BD 95 (Signal Corps) mfg. by Kellogg 24 volt DC, 5 connecting circuits, line relays—Designed for use with mag. sub-sets, but also may be used with CB phones with kick-coils. 22" long, 14" high, 13" deep. Black phenolic face, sheet metal cover.

BD 95, 20 line new, A-1 ..... $150.
BD 105, 12 line (same size) new, A-1 ..... 100.
BD 116 (W.E. #506B Special) 24 volt 12 CB Lines, 2 CB trunks, 3 LB lines or trunks, 5 connecting circuits. Same size and appearance as standard 506B.
new, A-1 ..... $195.
slightly used ..... 125.
W.E. 506 standard cordless swbds. 7 CB lines, 3 CB trunks, 5 conn. ckts. good used, reconditioned ..... $150.
W.E. 506B, 12 CB lines, 5 CB trunks ..... 195.

Protection

MDF TYPES

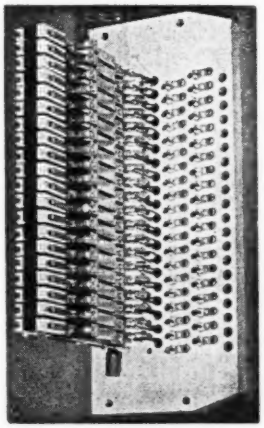
Western Electric

1435 W, 20 pair group consists of: #1269 A, 20 pr. prot. group complete with #76A heat coils, #26 & #27 dischargers, mounted on maple screw-terminal base—for wall mounting.

New—original factory carton—

A-1 ..... $15.00

(Note: By removing 2 bolts you have a standard #1269A group)



1435 W

1435 U, 20 pr. fuse groups, new, with 7A, 7 amp. fuses $5.00

MDF 1420 B, iron frame for mtg. ten 1435 W or U gps. floor type (against wall) 6½' high, 18" wide. New—(sold with order for prot. grps. only) $10.00

1269 A (W.E.) 20 pr. (see 1435 W above) fully equipped.
New $15.00
Reconditioned like new, fully equipped 10.00

1268 A (reconditioned only) 10.00

C 50 A (W.E.) 50 pr. (⅜" centers) equipped with #28 & #29 discharge blocks & #76A heat coils—New 47.50
Reconditioned like new 35.00

C 52 A, 52 pr. New $49.00—reconditioned 37.00

C 25 A, 25 pr. New 20.00—reconditioned (½ of C-50) 15.00

#675 (A.E.) 20 pr. (½" centers), equipped, new 12.50
Reconditioned 10.00

#100 (Cook) 20 pr. (½" centers), equipped, reconditioned .. 15.00
23 pr. as above 16.50

Reliable #308H, 25 pair. New 10.00

PBX & UNIVERSAL SWITCHBOARDS

W.E. #12 Central Office positions little-used, less line jacks .. $500.
—line & lamp jacks available—

W.E. 605B, PBX or CO positions, good used, less line equip .... $350.

#141 jacks on 112 mtg., slightly used $5.00

#12 lamp sockets on 137 mtg., caps, lamps 5.00

W.E. #550 PBX—50 to 160 line, from ..... $300.
#551A PBX—10 to 40 line, from ..... 350.
#551B PBX—50 to 320 line, from ..... 450.

—with or without line relays; cord circuits and trunks as desired—
Write for quotations on your specific needs.
—priced as removed from service or rebuilt to your specifications—

Kellogg K-100, 100 line, 15 cord ckts., 10 CB trunks, low type, like new ..... $650.

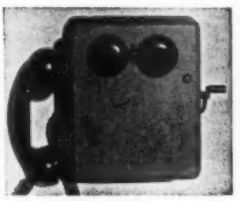
Kellogg 1600 line, 3 position & turning section—new (assembled as one unit) less line equipment (some available) ..... $1000.

Kellogg 800 line PBX positions, used, good condition, less line equip.

Stromberg-Carlson PBX, 2 position wire & equip. 100 lines each.

Stromberg-Carlson 1600 line PBX, 3 positions, less line equip.

Brand New $12.50 each in std. package of 8



5812 MX

Kellogg #5812 MX

5 bar, 1600 ohm, anti-sidetone circuit. Complete with F27 handset, coiled cord. Oak cabinet, painted dull green. New and perfect—original factory pack. (2500 or 1000 ohm ringer $1.50 extra.)

Less than 8, each $13.50

Distributing Frames

W.E. #1425 Type—6 ft. (like new). 1 to 5 verticals—each vertical mounts 100 pair ½" center prot. grps. or 150 pair ⅜".

Per vertical, with dist rings, fanning strips ..... $ 25.00

5 vertical — welded one unit, 32" wide 100.00

Reliable 50 pr. MDF with 50 pr. #308H protectors, terminals, complete $39.50

Wall Brackets & Frames (many types)

MDF Wood Terminal Blocks, New ..... 6¢ pr.

Switchboard Cable, braid or plastic

Open Wire Protectors

W.E. 83A, 5 pair, equipped with #26 & 27 (or 30) blocks cast iron or alum. pole mtg., new $4.50

W.E. #84A (as used in 83A) 5 pr. equipped as above, less mtg. box, new $2.75

Substation Types

93 AW (W.E.) 98A in wp. mtg. can, new 1.75

Cook—similar to RO type outside, with H-20 protector unit equipped A-9 5 amp. Tru-Blo lavite fuses, also has jack (W.E. 223) for use with #47 plug. Size: 2"x3"x7" high, with bracket. (Jack easily removed.)
Cook cat. No. 523-1, pole jack, new $1.25
Less prot. #523-51, pole jack, new .50
(sample on request)

FUSES

(Used with 98 A & 93 AW)

11 C, sealed can of 20, new $1.25
5 cans 5.00

Heat Coils—W.E. 76A, new ..... 10¢
hundred lots, ea. ..... 8¢
thousand lots, ea. ..... 7¢

Handsets

W.E. E1 (converted to F1) $3.00
W.E. F1AW3, new (CB or LB) 5.00
A.E. type 41, used A-1 ..... 3.00
W.E. C1 hanger & E1 handset 7.00
W.E. #202 desk set E1 handset 6.00
#300 N, 2500 ohm, 5 bar subset 7.50
#534 CB subset, new cover 2.50

CB Subsets, Handset, sl. used

A.E. #40, Stromberg-Carlson 1222, North Elec. type 6, Leich 700 st. line, harmonic, decimonic.

blanked for dial $10.00
with A.E. #24 dial 12.50

— Parts for older phones —

Jan. billing, if you prefer—

Telectric Co.

1218 VENICE BOULEVARD
LOS ANGELES 6, CALIF.
Richmond 8-2249

Shipped on approval — we pay two-way freight if you are not entirely satisfied.

XUM

ESCAMBIA POLES

Long Leaf and Slash Pine

- STRAIGHTER
- STRONGER
- LAST LONGER

Creosote and Penta Pressure Treated

ESCAMBIA TREATING CO.

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PENSACOLA, FLORIDA
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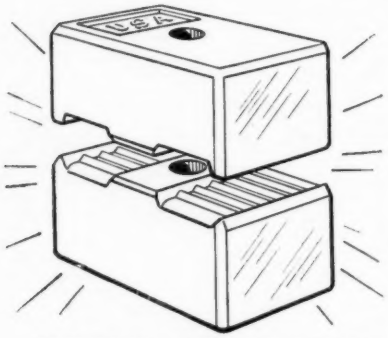
PROVIDE CONTINUOUS SERVICE WITH PORCELAIN PRODUCTS TELEPHONE INSULATORS



Made of highest quality dry-process electrical porcelain . . . Porcelain Products telephone insulators assure long, continuous service . . . customer satisfaction. Porcelain Products, Inc. has served the telephone industry for decades, offering a complete line of insulators that meet AT & T and REA specifications . . . simplifying installation . . . reducing maintenance. Write for complete information, today!

PORCELAIN PRODUCTS, INC.
Findlay, Ohio

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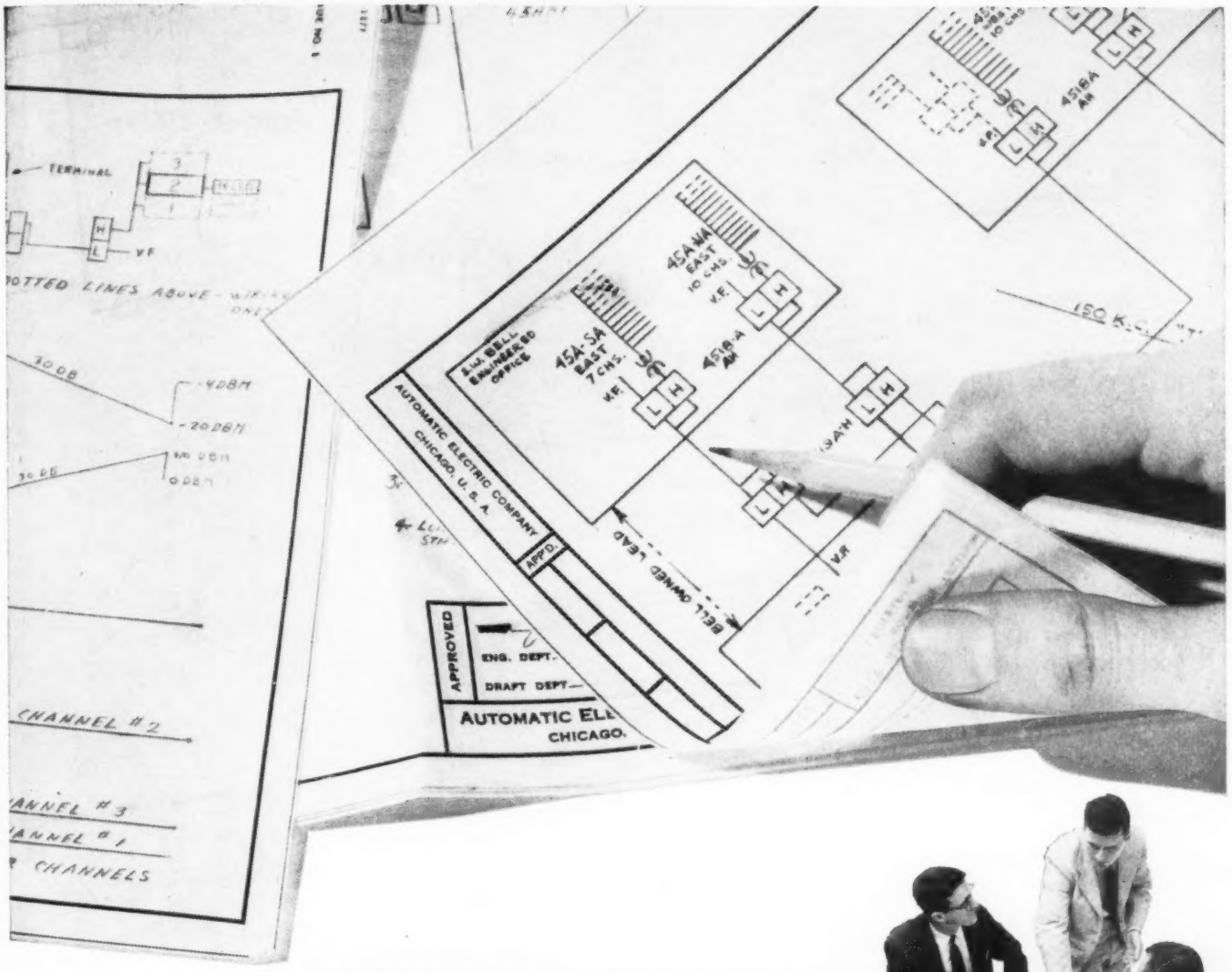
Yates Construction Co.	81
York-Hoover Corporation	—



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Automatic Electric's "Package Plan" makes it easy for you to add carrier equipment in providing the circuits you need, without overloading your engineering and installation staff.

Combined in this "Package Plan" are Lenkurt's "Engineer, Furnish and Install" Service and Automatic Electric's "Follow-Thru" Engineering. Together, these services are all that's required to handle your job—and do it economically.

SPECIFICALLY, HERE'S WHAT WE DO—

Analyze Your Needs. Automatic Electric's "Follow-Thru" engineers study your communications problem and give you a complete over-all plan. If rearrangements are necessary in your present equipment, outside plant, or circuit layout, the most economical way is suggested. The correct carrier equipment for each specific part of the plan is recommended—*and you are told why.* The resulting circuits will function as an integral part of your over-all operations—not as an accessory that is "grafted on" as an afterthought.

Engineer, Furnish, and Install. Each carrier system is engineered to your requirements, pre-assembled, wired and tested by Lenkurt, using the most modern and precise techniques. Lenkurt "E F & I" technicians handle all the details of installation and turn the system over to you, ready to "cut over" for service on the promised date.

Train to Operate and Maintain. Lenkurt engineers will train your men to operate Lenkurt equipment right on the job. They furnish detailed equipment bulletins, line-up and operating instructions, and maintenance techniques.

"Follow-Thru" Engineering always available. Automatic Electric's "Follow-Thru" Engineering Service does not stop with the planning stage, or even with the cut-over; it is available *throughout the life of your Lenkurt Carrier.*

A letter or call will bring an Automatic Electric carrier engineer with all the facts on our "Package Plan". *Write or call* Automatic Electric Sales Corporation, 1033 West Van Buren Street, (HAymarket 1-4300), Chicago 7, Illinois. *In Canada:* Automatic Electric Sales (Canada) Ltd., Toronto. *Offices in principal cities.*

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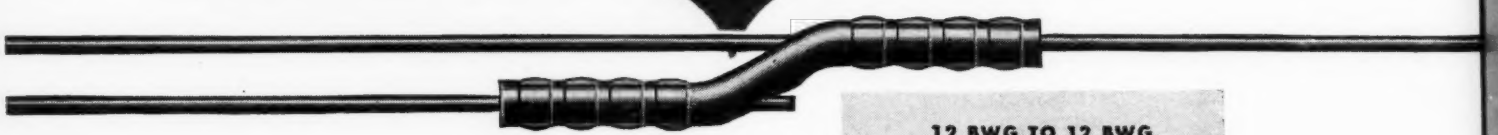

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